Jiawei Da

Postdoctoral Research Fellow

Department of Earth and Planetary Sciences, the University of Texas at Austin

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Research Interests

Surface processes; low-temperature isotope geochemistry; paleoclimate; water cycle; carbon cycle

Education

Nanjing University *Nanjing, China*

Doctor of Philosophy *09/2013-06/2020*

- Dissertation: Quantitative reconstruction of paleoatmospheric CO_2 levels using pedogenic carbonates from the Chinese Loess Plateau
- Supervisor: Dr. Junfeng Ji

Jilin University *Changchun, China*

Bachelor of Science, Geology *09/2008-07/2012*

Research Experience

The Pennsylvania State University *State College, PA*

Postdoctoral Scholar *09/2025-Present*

- Advisor: Dr. Max Lloyd
- Identifiying methyl groups formed through abiotic and biologic processes using clumped isotopologues

The University of Texas at Austin *Austin, TX*

Postdoctoral Research Fellow *08/2022-08/2025*

- Advisor: Dr. Dan Breecker
- Modernizng paleosol-CO2 reconstructions via clumped isotope and trace-amount organic carbon isotope analyses
- Decoding Pliocene rainfall seasonality over East Asia via clumped isotope and triple oxygen isotope of pedogenic carbonates
- Devlopment and application of paleosol-carbonate-based proxy system models using Bayesian inversion
- Refining the land snail shell-based flux balance model based on modern observations

Nanjing University *Nanjing, China*

Postdoctoral Research Fellow *08/2020-07/2022*

- Advisor: Dr. Xiancai Lu
- Determined the formation time of pedogenic carbonates from the Chinese Loess Plateau using forward and numerical modeling
- Identified continuous fresh carbon input into subsoil organic carbon pool via radiocarbon fingerprinting

Nanjing University *Nanjing, China*

Research Assistant *09/2015-07/2020*

- Maintained the daily operation of FTIR and UV/VIS/NIR spectrometer

Journal Articles

1. Okafor, B., **Da, J.**, Beverly, E. J., Driese, S., Nordt, L., & Breecker, D. O. (2025). A component of atmospheric vapor in the water of a floodplain Vertisol. *Journal of Hydrology*, *661*, 133538. https://doi.org/10.1016/j.jhydrol.2025.133538

2. Mu, J., **Da, J.**, Yang, H., Ji, J., Liu, L., & Li, W. (2025). An abrupt change in source materials for Chinese loess deposits at the Pliocene-Pleistocene boundary: Insights from K isotopes and modeling. *Earth and Planetary Science Letters*, *668*, 119543. https://doi.org/10.1016/j.epsl.2025.119543

3. **Da, J.** (2025). Isotopic evidence for dew uptake by land snails from Bayesian modeling of body water δD and δ18O. *Chemical Geology*, *692*, 122953. https://doi.org/10.1016/j.chemgeo.2025.122953

4. **Da, J.**, Zhang, Y. G., Liu, X., Breecker, D. O., Li, G. K., Chen, T., & Ji, J. (2025). No apparent state-dependency of equilibrium climate sensitivity between the Pleistocene glacial and interglacial climate states. *Nature Communications*, *16*(1), 6608. https://doi.org/10.1038/s41467-025-61941-5

5. Sakthivel, T., Ghosh, P., Nair, N., & **Da, J.** (2024). Wildfire-enhanced Plio-Pleistocene CO2 drawdown through

terrestrial organic carbon burial. *Quaternary Science Reviews*, *338*, 108825. https://doi.org/10.1016/j.quascirev.2024.108825

6. **Da, J.**, Li, G. K., Breecker, D. O., & Ji, J. (2024). Particle-Size-Specific Radiocarbon Constraints Imply an Active Subsoil Organic Carbon Pool. *Journal of Geophysical Research: Biogeosciences*, *129*(5), e2024JG008102. https://doi.org/10.1029/2024JG008102

7. THE CENOZOIC CO2 PROXY INTEGRATION PROJECT (CENCO2PIP) CONSORTIUM. (2023). Toward a Cenozoic history of atmospheric CO2. *Science*, *382*(6675), eadi5177. https://doi.org/10.1126/science.adi5177

8. **Da, J.**, Li, G. K., & Ji, J. (2023). Seasonal changes in the formation time of pedogenic carbonates on the Chinese Loess Plateau during Quaternary glacial cycles. *Quaternary Science Reviews*, *305*, 108008. https://doi.org/10.1016/j.quascirev.2023.108008

9. **Da, J.**, Breecker, D. O., Li, T., Li, G., Lu, H., & Ji, J. (2023). A Humid East Asia During the Early Pliocene Indicated by Calcite Nodules From the Chinese Loess Plateau. *Paleoceanography and Paleoclimatology*, *38*(7), e2023PA004615. https://doi.org/10.1029/2023PA004615

10. Bao, R., Sheng, X., Meng, X., Li, T., Li, C., Shen, H., **Da, J.**, Ji, J., & Chen, J. (2022). 100 k.y. Pacing of the East Asian summer monsoon over the past five glacial cycles inferred from land snails. *Geology*. https://doi.org/10.1130/G50243.1

11. Meng, X., Li, G. K., Liu, L., Long, X., Zhao, W., **Da, J.**, & Ji, J. (2022). Decoupled paleosol-based proxies in Chinese loess deposits: Role of leaching and illuviation processes. *Quaternary Science Reviews*, *298*, 107847. https://doi.org/10.1016/j.quascirev.2022.107847

12. **Da, J.**, Li, G. K., & Ji, J. (2021). Overestimate of C4 Plant Abundance Caused by Soil Degradation-Induced Carbon Isotope Fractionation. *Geophysical Research Letters*, *48*(24), e2021GL093407. https://doi.org/10.1029/2021GL093407

13. **Da, J.**, Zhang, Y. G., Li, G., & Ji, J. (2020). Aridity-driven decoupling of δ13C between pedogenic carbonate and soil organic matter. *Geology*. https://doi.org/10.1130/G47241.1

14. **Da, J.**, Zhang, Y. G., Li, G., Meng, X., & Ji, J. (2019). Low CO2 levels of the entire Pleistocene epoch. *Nature Communications*, *10*(1), 4342. https://doi.org/10.1038/s41467-019-12357-5

15. **Da, J.**, Zhang, Y. G., Wang, H., Balsam, W., & Ji, J. (2015). An Early Pleistocene atmospheric CO2 record based on pedogenic carbonate from the Chinese loess deposits. *Earth and Planetary Science Letters*, *426*, 69–75. https://doi.org/10.1016/j.epsl.2015.05.053

Under Review

1. Chen, Z., **Da, J.**, Li, C., Xue, L., Liu, G., Sheng, X., Huang, J., & Ji, J. (2025). *Crystallization fractionation in anthropogenic carbonate: Geochemical constraints on dead carbon*. SCIENCE CHINA Earth Sciences.

2. Czwakiel, N., Gallagher, T., Serach, L., Ludvigson, G., Gao, P., Nie, J., Suc, J.-P., **Da, J.**, & Breecker, D. (2025). *The onset of summer drying on the iberian peninsula during pliocene global cooling*. Paleoceanography and Paleoclimatology.

In Preparation

1. **Da, J.**, Bowen, G., Harper, D., & Huntington, K. (2025). *Improving paleosol-based atmospheric CO2 reconstruction via joint proxy inversion*. In prep for Paleoceanography and Paleoclimatology.

2. **Da, J.**, Serach, L., Sun, C., Gallagher, T., Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., Feng, R., Ji, J., & Breecker, D. (2025). *Multi-stage C4 expansion over east asia paced by monsoon-jet dynamics*. In prep for Nature.

Invited Talks

Late Miocene-Pliocene rainfall seasonality over East Asia through the lens of the westerly jet *2025*

University of Nevada, Las Vegas

Miocene-Pliocene rainfall seasonality over East Asia recorded by soil carbonates *2025*

Southern Methodist University

How to make the paleosol-CO2 proxy more useful? *2025*

Southern Methodist University

East Asian hydroclimate during the Pliocene: new isotopic evidence from soil carbonate *2024*

University of Washington

Continual glacial CO2 drawdown recorded by paleosols from the Chinese Loess Plateau *2023*

The University of New Mexico

Reconstructing past atmospheric CO2 levels with pedogenic carbonates from the Chinese loess deposits *2022*

The University of Texas at Austin

Conference Presentations

1. **Da, J.**, Serach, L., Gallagher, T., Sun, C., Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., Feng, R., Ji, J., & Breecker, D. (2024, December). *Pliocene hydroclimate changes over eastern china through the lens of the westerlies*. [Poster]. AGU fall meeting. Washington DC, DC, USA.

2. **Da, J.**, Serach, L., Gallagher, T., Sun, C., Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., Feng, R., Ji, J., & Breecker, D. (2024, August). *Summer drought over east asia during the warm pliocene: Evidence from clumped isotope and triple oxygen isotope compositions of soil carbonate*. [Talk]. 2024 goldschmidt conference. Chicago, IL, USA.

3. **Da, J.**, Serach, L., Gallagher, T., Sun, C., Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., Feng, R., Ji, J., & Breecker, D. (2024, April). *Enhanced summer drought over east asia across the miocene-pliocene boundary*. [Poster]. Miocene climate workshop. Tucson, AZ, USA.

4. **Da, J.**, Zhang, Y. G., Liu, X., Li, G., Breecker, D., & Ji, J. (2023, December). *Pleistocene global cooling driven by declining glacial CO2 levels*. [Invited talk]. AGU fall meeting. San francisco, CA, USA.

5. Bowen, G., Harper, D., **Da, J.**, Hönisch, B., & Montañez, I. (2023, October). *Toward an omni-proxy reconstruction of cenozoic CO2*. [Talk]. The geological science of america meeting. Pittsburgh, PA, USA.

6. **Da, J.**, Breecker, D., Lu, H., & Ji, J. (2023, October). *A humid east asia during the early pliocene indicated by calcite nodules from the chinese loess plateau*. [Invited talk]. The geological science of america meeting. Pittsburgh, PA, USA.

7. **Da, J.**, Li, G., & Ji, J. (2023, July). *Seasonal changes in the formation time of pedogenic carbonates on the chinese loess plateau during quaternary glacial cycles*. [Talk]. 2024 goldschmidt conference. Leon, france.

8. **Da, J.**, Zhang, Y. G., Li, G., & Ji, J. (2022, November). *Reconstructing pleistocene atmospheric CO2 levels using pedogenic carbonates from the chinese loess plateau*. [Talk]. INQUA LoessFest. Virtual conference.

9. **Da, J.**, Li, G., & Ji, J. (2021, November). *Carbon isotope fractionation during the burial and decomposition of soil organic matter – evidence from the paleosols on the chinese loess plateau*. [Talk]. 8th biology and organic geochemistry conference. Xiamen, china.

10. **Da, J.**, Zhang, Y. G., Li, G., & Ji, J. (2021, August). *Quantitative constraint of the effect of atmospheric CO2 on the c isotopic compositions of pedogenic carbonates on the chinese loess plateau*. [Talk]. The 6th conference on earth system science. Shanghai, china.

11. **Da, J.**, Zhang, Y. G., Li, G., & Ji, J. (2020, August). *Refining the paleosol-CO2 proxy and the reconstruction of early-pleistocene CO2 levels*. [Talk]. 2020 goldschmidt conference. Virtual conference.

12. **Da, J.**, & Ji, J. (2016, July). *Reconstructing past atmospheric CO2 levels with pedogenic carbonates from the chinese loess deposits*. [Poster]. 2016 goldschmidt conference. Yokohama, japan.

Awards

NASA Postdoctoral Fellowship *2025*

National Aeronautics and Space Administration *$198060*

NSF CO2PIP Project Postdoctoral Fellowship *2022*

National Science Foundation *$156000*

NSF-China Earth Sciences Postdoctoral Fellowship *2021*

National Science Foundation of China *$15000*

Best Doctoral Dissertation Award *2021*

Jiangsu Provincial Department of Education

Best Doctoral Dissertation Award *2021*

Nanjing University

Yuxiu Young Scholar Program Postdoctoral Fellowship *2020*

Nanjing University *$86000*

Li Siguang Outstanding PhD Candidate Award *2020*

Li Siguang Geological Science Award Foundation *$4300*

- National award to five selective Ph.D. candidates majored in Geology per year in recognition of high academic achievements

Outstanding PhD student *2020*

Nanjing University

Program A for outstanding Ph.D. students, Nanjing University *2018*

Nanjing University *$17000*

First Prize of National Scholarship *2015*

Ministry of Education *$4200*

Grant-writing Experience

Reconstruction of Holocene paleoenvironmental gradients across the southern Great Plains using snailshells from archaeological collections *2024*

National Science Foundation *Not Funded*

- Role: Formal analysis; reviewing and editing

Quantifying the decomposition-related carbon isotopic fractionation of soil organic matter in the eolian deposits from the Chinese Loess Plateau *2021*

National Natural Science Foundation of China *Funded ($41000)*

- Role: Conceptualization; original draft preparation; formal analysis; reviewing and editing

Understanding the seasonality and formation of pedogenic carbonate on the Chinese Loess Plateau *2021*

China Postdoctoral Science Foundation *Funded ($7000)*

- Role: Conceptualization; original draft preparation; formal analysis; reviewing and editing

Reconstructing atmospheric CO2 levels over the past eight million years using the eolian deposits from the Chinese Loess Plateau *2020*

National Natural Science Foundation of China *Funded ($400000)*

- Role: Conceptualization; original draft preparation; formal analysis; reviewing and editing

Evaluating atmospheric CO2 signal in the carbon isotope composition of calcite nodules from the Chinese Loess Plateau *2018*

National Natural Science Foundation of China *Funded ($92000)*

- Role: original draft preparation; formal analysis; reviewing and editing

Small Grants

JSG Go Further Find *2024*

The University of Texas at Austin *$1000*

Miocene Climate Workshop Travel Grant *2024*

National Science Foundation *$1000*

UT Staff Council Professional Development Grant *2023*

The University of Texas at Austin *$1500*

Goldschmidt Travel Grant *2016*

Geochemical Society *$1000*

Teaching Experience

GEO 401: Physical Geology *2024 Fall*

Lecturer

- Participated in course design; Taught weekly lectures

GEO 391: Environmental Isotope Geochemistry *2025 Spring*

Co-instructor

- Participated in course design; Taught weekly lectures

Professional Service

Conference session convenor

- AGU Fall Meeting, December 2023, San Francisco, CA, US

Undergraduate/High School student Mentor

- 2016 - current, mentored undergraduate students conducting research projects.
- Mentored students: Jinjin Yang (2016-2017), Xia Wang (2018-2019), Ruiqing Ji (2021-2022), Hudson Thomas (2024)

Graduate Mentor

- 2018 - current, mentored graduate students conducting research projects.
- Mentored students: Hanzhao Zhai (2018-), Jun Mu (2020-2022), Chenglong Li (2018-2025), Zhanpeng Chen (2022-), Nicole Czwakiel (2022-2025), Morgan Mellum (2024-)

Judge

- 2025, Longhorn Research Poster Session
- 2024, OSPA Judge, AGU Fall Meeting
- 2023, the 13th Annual Jackson School of Geoscience Student Research Symposium
- 2023, OSPA Judge, AGU Fall Meeting

Ad Hoc Reviewer

- Science Advances
- Proceedings of the National Academy of Sciences (2)
- Earth Science Reviews
- Geophysical Research Letters
- Paleoceanography and Paleoclimatology (2)
- Global and Planetary Change (2)
- Earth's Future
- Chemical Geology (2)
- Quaternary Science Reviews
- Geochemistry, Geophysics, Geosystems
- Geoderma
- Environmental Science & Technology
- Applied Geochemistry
- Atmosphere (3)
- Arabian Journal of Geosciences
- Vertebrate Paleobiology and Paleoanthropology Series
- Water
- Forests

- Soil systems

Skill Sets

Lab techniques

- Isotope Ratio Mass Spectrometer (MAT253, Nucarb)
- Laser Spectroscopy (Picarro CRDS, Aerodyne TILDAS)
- Elemental Analyzer (EA)
- Fourier Transform Infrared Spectroscopy (FTIR)
- Scanning Electronic Microscopy (SEM)

Programming and Software

- Rstudio (data analyses, visualization, modeling, mapping)
- Excel (data analyses, visualization)
- CorelDRAW (visualization)

Languages

- Chinese (Native Speaker)
- English (Professional proficiency)

References

Junfeng Ji, Ph.D. *jijunfeng@nju.edu.cn*

Professor, Nanjing University

Daniel Breecker, Ph.D. *breecker@jsg.utexas.edu*

Professor, The University of Texas at Austin

Gabe Bowen, Ph.D. *gabe.bowen@utah.edu*

Department Chair, Professor, University of Utah

Katharine Huntington, Ph.D. *kate1@uw.edu*

Professor, University of Washington

Isabel Montañez *ipmontanez@ucdavis.edu*

Director, Institute of the Environment, Distinguished Professor, UC Davis