Jiawei **Da**

Postdoctoral Research Fellow

Jackson School of Geosciences, The University of Texas at Austin

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Research Interests

Paleoclimate; soils and soil processes; carbon cycle; water cycle

Education

Nanjing University *Nanjing, Jiangsu, China*

PhD, Geology *2015-2020*

- Thesis: Quantitative reconstruction of paleoatmospheric CO2 levels using pedogenic carbonates from the Chinese Loess Plateau
- Advisor: Junfeng Ji

Nanjing University *Nanjing, Jiangsu, China*

MS (en route) *2013-2015*

Jilin University *Changchun, Jilin, China*

BSc, Geology *2008-2012*

Research Experience

The University of Texas at Austin *Austin, Texas, USA*

Postdoctoral Fellow *Aug 22–Present*

- Advisor: Dr. Daniel O Breecker
- Documenting and modernizing published CO2 records from a suite of proxies, with the goal of building a statistically robust and fully integrated Phanerozoic CO2 curve
- Utilizing clumped isotope thermometry and triple oxygen isotope compositions of pedogenic carbonates to understand climate and ecosystem change recorded in the geologic record
- Developing a multi-isotope proxy system model for soil carbonate to quantitatively reconstruct various environmental variables through joint proxy inversion
- Developing a pretreatment method capable of precise carbon isotopic analysis of organic matter in calcium carbonate-rich materials

Nanjing University *Nanjing, Jiangsu, China*

'Yuxiu Young Scholar Program' Postdoctoral Researcher *Sep 20–Aug 22*

- Advisor: Dr. Xiancai Lu
- Explored the variations and controls of Pliocene hydroclimate over East Asia through a multi-proxy approach based on soil carbonate
- Determined the formation season of and the paleoclimate information recorded in pedogenic carbonates from the Chinese Loess Plateau, using stable isotope and numerical modeling approaches
- Investigated the dynamics of subsoil organic carbon pool using stable isotope and radiocarbon analyses combined with mass-balance modeling approach

Nanjing University *Nanjing, Jiangsu, China*

Research Assistant *Sep 15–Jun 20*

- Co-developed a fast measurement technique of soil carbonate with trace quantities (<10%) using Fourier Transform InfRared Spectroscopy (FTIR)
- Maintained the daily operation of FTIR and UV/VIS/NIR spectrometer

Publications

1. 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
2. **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 e2024JG008102 2024JG008102
3. 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

4. **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
5. **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
   e2023PA004615 2023PA004615
6. 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
7. 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
8. **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
   https://doi.org/10.1029/2021GL093407
9. **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
10. **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
11. **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. Czwakiel, N., Gallagher, T., Serach, L., Ludvigson, G., Gao, P., Nie, J., Suc, J.-P., **Da, J.**, & Breecker, D. (2024). Onset of aridity on the iberian peninsula from reduced summer rainfall during Pliocene global cooling events. In *Paleoceanography and Paleoclimatology*.
2. **Da, J.**, Xiaoqing, L., Zhang, Y. G., Li, G., Breecker, D., & Ji, J. (2024). Differential Pleistocene glacial and interglacial regional climate sensitivities help to constrain our future. In *Nature Communications*.
3. Mu, J., **Da, J.**, Ji, J., & Li, W. (2024). Potassium isotopic constraints on the provenance of Chinese eolian deposits since 6 ma. In *Earth and Planetary Science Letters*.
4. Okafor, B., **Da, J.**, Beverly, E., Driese, S., Nordt, L., & Breecker, D. (2024). A component of atmospheric vapor in the water of a floodplain vertisol. In *Journal of Hydrology*.

In Preparation

1. Chen, Z., **Da, J.**, Sheng, X., & Ji, J. (2024). *Geochemical characteristics of anthropogenic carbonate and implications for reliable 14C dating*.
2. **Da, J.**, Sun, C., Serach, L., Gallagher, T., Feng, R., Lu, H., Zhang, H., Wang, H., Ji, S., Katharine, H., Zachary, S., Ji, J., & Breecker, D. (2024). *Pliocene hydroclimate over East Asia through the lens of the westerly jet*.
3. Li, C., Sheng, X., Bao, R., **Da, J.**, Wei, H., & Chen, J. (2024). *A discussion on the geochemistry (δ13C, δ18O and trace element/ca ratios) of multi-types of CaCO3 from paleosol-loess sequence and their paleoenvironmental implications*.

Mentoring

Morgan Mellem (PhD candidate at UT Austin) *2024–Present*

- Investigating soil carbonate dynamics via reactive transport modeling and field measurements

August Aalto (PhD candidate at UT Austin) *2023–Present*

- Soil carbon dynamics in deltas

Nicole Ferrie (PhD candidate at UT Austin) *2023–Present*

- Boron sorption on alunimum oxide sites of phyllosilicates: experimental validation and application to subduction zones and paleosols

Nicole Czwakiel (PhD candidate at UT Austin) *2022–Present*

- Pliocene hydroclimate variations on the Iberian Peninsula based on terrestrial carbonates in the Teruel Basin, Spain

Hudson Thomas (12th grade student intern from BASIS San Antonio Shavano working 15 hrs per week in stable isotope lab at UT Austin, now at the University of Michigan) *2024*

- Developing a carbonate clumped isotope analysis line

Zhanpeng Chen (PhD candidate at Nanjing University) *2022–Present*

- Anthropogenic carbonates from archeological sites as a tracer for human-environment interactions

Hanzhao Zhai (PhD candidate at Nanjing University) *2018–Present*

- Clay mineralogy in the Miocene-Pliocene Red Clay formation from the Chinese Loess Plateau and its relationship with regional hydroclimate

Chenglong Li (PhD at Nanjing University) *2015–2022*

- Reconstructing late Pleistocene climate variability in eastern China using the stable isotope compositions and trace elements of land snails

Jun Mu (PhD candidate at Nanjing University) *2021–2022*

- Potassium isotope as a tracer for eolian dust provenance

Ruiqing Ji (BS at Nanjing University, now at Columbia University) *2021–2023*

- Differentiating secondary carbonate from detrital carbonate using particle separation

Jinjin Yang (BS at Nanjing University) *2016–2017*

- Iron oxide and carbonate concentrations of the Chinese loess in response to changes in the East Asian summer monsoon

Teaching

The University of Texas at Austin *Austin, Texas, USA*

Lecturer *2024 Fall*

- GEO 401 - Physical Geology

The University of Texas at Austin *Austin, Texas, USA*

Co-instructor *2025 Spring*

- GEO 391 - Isotope Geochemistry

Honors and Awards

NSF CO_2PIP Project Postdoctoral Fellowship *2022*

NSF-China Earth Sciences Postdoctoral Fellowship *2021*

Best Doctoral Dissertation Award, Jiangsu Province *2021*

Best Doctoral Dissertation Award, Nanjing University *2021*

Li Siguang Outstanding Ph.D. Candidate Award *2020*

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

Outstanding Ph.D. student, Nanjing University *2020*

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

First Prize of National Scholarship *2015*

Major Research Funding

National Natural Science Foundation of China (PI-$41000) *2021-2022*

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

China Postdoctoral Science Founadtion (PI-$7,000) *2021-2022*

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

National Natural Science Foundation of China (co-PI-$400,000) *2020-2025*

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

National Natural Science Foundation of China (co-PI-$92,000) *2018-2021*

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

National Natural Science Foundation of China (co-PI-$98,000) *2018-2021*

- Iron Mineralogy and Speciation in Clay-Sized Fractions of Chinese Desert Sediments and its contribution to the North Pacific bioavailable iron

Small Grants

JSG Go Further Fund ($1000) *2024*

Miocene Climate Workshop Travel Grant ($1000) *2024*

UT Staff Council Professional Development Grant ($1500) *2023*

Goldschmidt Travel Grant ($1000) *2016*

Conference Presentations

1. **Da, J.**, Sun, C., Serach, L., Gallagher, T., Feng, R., Lu, H., Zhang, H., Wang, H., Ji, S., Katharine, H., Zachary, S., Ji, J., & Breecker, D. (2024). *Enhanced summer drought over East Asia across the miocene-pliocene boundary*. [Poster]. Miocene climate workshop. Tucson, AZ, USA.
2. **Da, J.**, Sun, C., Serach, L., Gallagher, T., Feng, R., Lu, H., Zhang, H., Wang, H., Ji, S., Katharine, H., Zachary, S., Ji, J., & Breecker, D. (2024). *Pliocene summer drought over eastern China through the lens of the westerlies*. [Talk]. Goldschmidt conference. Chicago, IL, USA.
3. **Da, J.**, Sun, C., Serach, L., Gallagher, T., Feng, R., Lu, H., Zhang, H., Wang, H., Ji, S., Katharine, H., Zachary, S., Ji, J., & Breecker, D. (2024). *Rainfall seasonality changes over northern China during 7-2.6 Ma: Evidence from clumped isotope and triple oxygen isotope compositions of soil carbonates*. [Poster]. American geophysical union meeting. Washington DC, DC, USA.
4. Bowen, G., Harper, D., **Da, J.**, Hönisch, B., & Montañez, I. (2023). *Toward an omni-proxy reconstruction of cenozoic CO2*. [Talk]. The geological science of america meeting. Pittsburgh, PA, USA.
5. **Da, J.**, Breecker, D., Lu, H., & Ji, J. (2023). *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.
6. **Da, J.**, Li, G., & Ji, J. (2023). *Seasonal changes in the formation time of pedogenic carbonates on the Chinese Loess Plateau during Quaternary glacial cycles*. [Talk]. Goldschmidt conference. Leon, France.
7. **Da, J.**, Zhang, Y., Liu, X., Li, G., Breecker, D., Chen, T., & Ji, J. (2023). *Pleistocene global cooling driven by declining glacial CO2 levels*. [Invited talk]. American geophysical union meeting. San francisco, CA, USA.
8. **Da, J.**, & Ji, J. (2021). *Quantitative constraint of the effect of atmospheric CO2 on the carbon isotopic compositions of pedogenic carbonates on the Chinese Loess Plateau*. [Talk]. The 6th conference on earth system science. Shanghai, China.
9. **Da, J.**, Li, G., & Ji, J. (2021). *Carbon isotope fractionation during the burial and decomposition of soil organic matter – evidence from the paleosols on the Chinese Loess Plateau*. [Talk]. The 8th biology and organic geochemistry conference. Xiamen, China.
10. **Da, J.**, Zhang, Y., Li, G., & Ji, J. (2020). *Refining the paleosol-CO2 proxy and the reconstruction of early-pleistocene CO2 levels*. [Talk]. Goldschmidt conference. Hawaii, HI, USA.
11. **Da, J.**, & Ji, J. (2016). *Reconstructing past atmospheric CO2 levels with pedogenic carbonates from the Chinese loess deposits*. [Poster]. Goldschmidt conference. Yokohama, Japan.

Invited Talks

University of Nevada, Las Vegas *2025*

- Has eastern China always been summer wet?

Southern Methodist University *2025*

- Miocene-Pliocene rainfall seasonality over East Asia
- How to make the paleosol-CO2 proxy more useful?

University of Washington *2024*

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

University of New Mexico *2023*

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

The University of Texas at Austin *2022*

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

Skill Sets

Lab techniques

- Isotope Ratio Mass Spectrometry (IRMS): Stable carbon and oxygen isotope analyses; clumped isotope analyses
- Tunable Infrared Laser Direct Absorption Spectroscopy (TILDAS): Triple oxygen isotope analyses
- Cavity Ring-down Spectroscopy (CRDS): Stable carbon and oxygen isotope analyses
- Elemental Analyzer (EA): Carbon and nitrogen analyses
- Fourier Transform Infrared spectroscopy (FTIR): Carbonate content, organic functional groups
- Scanning Electronic Microscopy (SEM): Mineral identification
- Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES): Trace elemental analyses

Programming and software

- Rstudio, Matlab, CorelDRAW, ArcGIS, Excel

Languages

- Chinese (native speaker), English (fluent)

Outreach and Services

Communications Manager *2024-2025*

- GSA Soils and Soil Processes Division

Journal reviewer *2025*

- Earth Science Reviews; Proceedings of National Academy of Sciences; Geoderma; Arabian Journal of Geosciences; Environmental Science & Technology

OSPA judge *2024*

- AGU paleoclimatology and paleoceanography session

Journal reviewer *2024*

- Paleoceanography and Paleoclimatology; Global and Planetary Change; Quaternary Science Reviews; Chemical Geology (2); Applied Geochemistry; Earth's Future; Vertebrate Paleobiology and Paleoanthropology Series; Atmosphere; Water

Judge *2024*

- the 13th Annual Jackson School of Geoscience Student Research Symposium

Journal reviewer *2023*

- Geophysical Research Letters; Paleoceanography and Paleoclimatology

Convenor *2023*

- AGU paleoclimatology and paleoceanography session

OSPA judge *2023*

- AGU paleoclimatology and paleoceanography session

Journal reviewer *2022*

- Science Advances

Coursework

Paleoclimatology; Isotope Geochemistry; Data analysis; Aqueous Geochemistry

Field Experience

Chinese Loess Plateau *2013-2021*

- Led and participate in field trips to collect samples from multiple Quaternary loess-paleosol and Miocene-Pliocene Red Clay sections, bulit a soil CO2 monitoring site in 2019 and accumulated hourly data for a whole year.

Xorkol Basin *2019*

- Led field trips to Xorkol Basin, Mount Altai at the northeastern Tibetan Plateau, where paleosol and calcite nodule samples were collected from an Eocene eolian deposit.

Qujing, Yunnan *2018*

- Participated in field trips to Qujing, Yunnan Province, where we collected samples of paleosols, calcite nodules, and fossil leaves from the early Devonian Xujiachong Formation.

Membership

Geological Society of America *2022-Present*

American Geophysical Union *2020-Present*

Geochemical Society *2016-Present*