

Dr. Jiawei Da

Jackson School of Geosciences, The University of Texas at Austin
2305 Speedway Stop C1160, Austin, TX 78712
Cell: 737-587-9577, Email: jiawei@utexas.edu

EDUCATION

Nanjing University, China

Ph.D. in Geology 2015-2020

Thesis: *Quantitative reconstruction of paleoatmospheric CO₂ levels using pedogenic carbonates from the Chinese Loess Plateau*

Advisor: Dr. Junfeng Ji

MS (en route) in Geochemistry 2013-2015

Jilin University, China

B.S. in Geology 2008-2012

RESEARCH EXPERIENCE

Postdoctoral Fellow 2022/08-current

The University of Texas at Austin, Jackson School of Geosciences

Fellowship funded by NSF-FRES project

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
- Developing a proxy system model to interpret the oxygen isotope compositions of Holocene land snail shells across Texas and map changes in environmental gradients

'Yuxiu Young Scholar Program' Postdoctoral Researcher 2020/09 – 2022/08

Nanjing University, School of Earth Sciences and Engineering

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

Research Assistant

2015/09 – 2020/07

Nanjing University, Key Laboratory of Surficial Geochemistry, Ministry of Education

Advisor: Dr. Junfeng Ji

- 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

PUBLISHED

1. **Da, J.**, Li, G.K., Breecker, D.O., Ji, J., Particle-size-specific radiocarbon constraints imply an active subsoil organic carbon pool, *Journal of Geophysical Research: Biogeosciences*, 2024, 129(5), e2024JG008102 <https://doi.org/10.1029/2024JG008102>
2. Sakthivel, T., Ghosh, P., Nair, N., **Da, J.**, Plio-Pleistocene CO₂ drawdown regulated by wildfire-induced terrestrial organic carbon burial, *Quaternary Science Reviews*, 2024, 338, 108825. <https://doi.org/10.1016/j.quascirev.2024.108825>
3. Hönisch, B., ..., **Da, J.**, ..., Towards a Cenozoic History of Atmospheric CO₂, *Science*, 2023, 382(6675): eadi5177 <https://www.science.org/doi/10.1126/science.adi5177>
4. **Da, J.**, Li, T., Breecker, D.O., Li, G., Lu, H., Ji, J., A wetter East Asia during the early Pliocene indicated by calcite nodules from the Chinese Loess Plateau, *Paleoceanography and Paleoclimatology*, 2023, 38(7), e2023PA004615 <https://doi.org/10.1029/2023PA004615>
5. **Da, J.**, Li, G.K., Ji, J., Seasonal changes in the formation time of pedogenic carbonates on the Chinese Loess Plateau during Quaternary glacial cycles, *Quaternary Science Reviews*, 2023, 305, 108008 <https://doi.org/10.1016/j.quascirev.2023.108008>
6. Bao, R., Sheng, X., Meng, X., Li T., Li, C., Shen, H., **Da, J.**, Ji, J., Chen, J., 100 ky pacing of the East Asian summer monsoon over the past five glacial cycles inferred from land snails, *Geology*, 2022. <https://doi.org/10.1130/G50243.1>
7. **Da, J.**, Li, G., Ji, J., Overestimate of C₄ plant abundance caused by soil degradation-induced carbon isotope fractionation, *Geophysical Research Letters*, 2021, 48(24): e2021GL093407 <https://doi.org/10.1029/2021GL093407>
8. Meng, X., Li, G. K., Liu, L., Long, X., Zhao, W., **Da, J.**, & Ji, J., Decoupled paleosol-based proxies in Chinese loess deposits: Role of leaching and illuviation processes. *Quaternary Science Reviews*, 2022, 298, 107847. <https://doi.org/10.1016/j.quascirev.2022.107847>

9. **Da, J.**, Zhang, Y. G., Li, G., Ji, J., Aridity-driven decoupling of $\delta^{13}\text{C}$ between pedogenic carbonate and soil organic matter, *Geology*, 2020, 48(10): 981-985. <https://doi.org/10.1130/G47241.1>
10. **Da, J.**, Zhang, Y. G., Li, G., Meng, X., Ji, J., Low CO_2 levels of the entire Pleistocene Epoch, *Nature Communications*, 2019, 10(1): 1-9. <https://doi.org/10.1038/s41467-019-12357-5>
11. **Da, J.**, Zhang, Y. G., Wang, H., Balsam, W., Ji, J., An Early Pleistocene atmospheric CO_2 record based on pedogenic carbonate from the Chinese loess deposits, *Earth and Planetary Science Letters*, 2015, 426: 69-75. <https://doi.org/10.1016/j.epsl.2015.05.053>

IN PREP/IN REVIEW

* graduate mentee

12. **Da, J.**, Zhang, Y. G., Li, G.K., Breecker, D.O., Ji, J., Differential Pleistocene glacial and interglacial regional climate sensitivities help to constrain our future (under review, *Nature Communications*)
13. **Da, J.**, Sun, C., Serach, L., Gallagher, T., Feng, R., Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., Ji, J., Breecker, D., Pliocene hydroclimate over East Asia through the lens of the westerly jet (in preparation for *Nature*)
14. Mu, J.*, **Da, J.**, Ji, J., Li, W., Potassium isotopic constraints on the provenance of Chinese eolian deposits since ~ 6 Ma (2nd round review, *Geology*)
15. Chen, Z.*, **Da, J.**, Sheng, X., Ji, J., Geochemical Characteristics of Anthropogenic Carbonate and Implications for Reliable ^{14}C Dating. (under review, *Geochimica et Cosmochimica Acta*)
16. Zhai, H.*, **Da, J.**, Ji, J., A warm dry Pliocene hydroclimate over East Asia documented by smectite content from the Chinese Loess Plateau (in preparation for *Quaternary Science Reviews*)
17. Okafor, B., **Da, J.**, Beverly, E., Driese, S., Nordt, L., Breecker, D., A component of atmospheric vapor in the water of a floodplain Vertisol (in preparation for *Water Resources Research*)
18. Czwakiel, N.*, Gallagher, T., Serach, L., Alonso-Zarza, A., Ludvigson, G., Gao, P., Nie, J., Suc, J.P., **Da, J.**, Breecker, D.O., Onset of Aridity on the Iberian Peninsula from reduced summer rainfall During Pliocene Global Cooling Events (in preparation for *Paleoceanography and Paleoclimatology*)
19. Li, C.*, Sheng, X., Bao, R., **Da, J.**, Wei H., Chen J., A discussion on the geochemistry ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$ and trace element/Ca ratios) of multi-types of CaCO_3 from paleosol-loess sequence and their paleoenvironmental implications (in preparation for *Chemical Geology*)

MENTORING

Morgan Mellum (2024-)

PhD student at UT Austin

Project: Investigating soil carbonate dissolution and precipitation based on reactive transport modeling and field measurements

August Aalto (2023-)

PhD candidate at UT Austin

Project: The role of soil carbon in deltas

Nicole Ferrie (2023-)

PhD candidate at UT Austin

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

Nicole Czwakiel (2022-)

PhD candidate at UT Austin

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

Hudson Thomas (2024)

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

Project: Developing a carbonate clumped isotope analysis line ([project blog](#))

Zhanpeng Chen (2022-)

PhD student at Nanjing University

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

Chenglong Li (2018-)

PhD student at Nanjing University

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

Hanzhao Zhai (2018-)

PhD student at Nanjing University

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

Jun Mu (2020-)

PhD student at Nanjing University
Project: Potassium isotope as a tracer for eolian dust provenance

Jinjin Yang (2016-2017)

Undergraduate student at Nanjing University
Project: Variations of iron oxide and carbonate contents within the Chinese loess in response to changes in the East Asian summer monsoon

TEACHING

Lecturer, University of Texas at Austin
GEO 401 Physical Geology Fall 2024

HONORS AND AWARDS

NSF CO ₂ PIP Project Postdoctoral Fellowship	2022
NSF-China Earth Sciences Postdoctoral Fellowship	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)	2021-2022
<i>Quantifying the decomposition-related carbon isotopic fractionation of soil organic matter in the eolian deposits from the Chinese Loess Plateau</i>	

Total Award: (\$41,000)

China Postdoctoral Science Foundation (PI)	2021-2022
<i>Understanding the seasonality and formation of pedogenic carbonate on the Chinese Loess Plateau</i>	

Total Award: (\$7,000)

National Natural Science Foundation of China (co-PI)	2020-2025
<i>Reconstructing atmospheric CO₂ levels over the past eight million years using</i>	

the eolian deposits from the Chinese Loess Plateau

Total Award: (\$400,000)

National Natural Science Foundation of China (co-PI) 2018-2021

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

Total Award: (\$92,000)

National Natural Science Foundation of China (co-PI) 2018-2021

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

Total Award: (\$98,000)

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. **J.Da**, C. Sun, L. Serach, T. Gallagher, H. Lu, H. Zhang, H. Wang, S. Ji, K. Huntington, Z. Sharp, J. Ji, D. Breecker, Pliocene summer drought over eastern China through the lens of the westerlies, Talk, *Goldschmidt 2024*, Chicago, Illinois (2024)
2. **J.Da**, C. Sun, L. Serach, T. Gallagher, H. Lu, H. Zhang, H. Wang, S. Ji, K. Huntington, Z. Sharp, J. Ji, D. Breecker, Enhanced summer drought over East Asia across the Miocene-Pliocene boundary, Poster, *Miocene Climate Workshop*, Tucson, Arizona (2024)
3. **J.Da**, Y.G. Zhang, X. Liu, G. Li, D. Breecker, T. Chen, J. Ji, Pleistocene Global Cooling Driven by Declining Glacial CO₂ Levels, **Invited talk**, *American Geophysical Union Meeting*, San Francisco, California, December (2023)
4. G. Bowen, D. Harper, **J. Da**, B. Hönisch, I.P. Montanez, Toward an omni-proxy reconstruction of Cenozoic CO₂, Talk, *The Geological Science of America Meeting*, Pittsburgh, Pennsylvania, October (2023)
5. **J. Da**, D. Breecker, H. Lu, J. Ji. 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, Pennsylvania (2023)
6. **J. Da**, G.K. Li, J. Ji, *Seasonal changes in the formation time of pedogenic carbonates on the Chinese Loess Plateau during Quaternary glacial cycles*, Talk, *Goldschmidt conference*,

Leon, France (2023)

7. **J. Da**, Y.G. Zhang, G.K. Li, J. Ji, Reconstructing Pleistocene atmospheric CO₂ levels using pedogenic carbonates from the Chinese Loess Plateau, *INQUA LoessFest*, Virtual (2022)
8. **J. Da**, G.K. Li, J. Ji, 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 (2021)
9. **J. Da**, J. Ji, 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 (2021)
10. **J. Da**, Y.G. Zhang, G. Li, X. Meng, J. Ji, Refining the paleosol-CO₂ proxy and the reconstruction of early-Pleistocene CO₂ levels, Talk, *Goldschmidt virtual* (2020)
11. **J. Da**, J. Ji, Reconstructing past atmospheric CO₂ levels with pedogenic carbonates from the Chinese loess deposits, Poster, *Goldschmidt 2016*, Yokohama, Japan (2016)

INVITED PRESENTATIONS

East Asian hydroclimate during the Pliocene: new isotopic evidence from soil carbonate, <i>Isolab, The University of Washington, Seattle, WA</i>	2024
Continual glacial CO ₂ drawdown recorded by paleosols from the Chinese Loess Plateau, <i>Center for Stable Isotope Seminar, The University of New Mexico, Albuquerque, NM</i>	2023
Reconstructing Pleistocene atmospheric CO ₂ levels using paleosols from the Chinese Loess Plateau, <i>Paleoclimatology Group Virtual Seminar Series</i>	2023
Reconstructing past atmospheric CO ₂ levels with pedogenic carbonates from the Chinese loess deposits, <i>Water, Climate and Environment seminar, Jackson School of Geosciences, The University of Texas at Austin, Austin, TX</i>	2022

SKILL SETS

Lab techniques

Instrument	Application
Isotope Ratio Mass Spectrometer (IRMS, e.g., MAT253, Nucar, Picarro)	Stable carbon and oxygen isotope analyses; clumped isotope analyses
Aerodyne Tunable Infrared Laser Direct Absorption Spectroscopy (TILDAS)	Triple oxygen isotope analyses; clumped 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
	Wet chemistry lab sample processing

Programming and Software: R, Matlab, CorelDRAW, ArcGIS, Panoply, Excel

Languages: Chinese (native speaker), English (fluent).

OUTREACH AND SERVICES

Reviewer for *Science Advances* (1), *Geophysical Research Letters* (1), *Global and Planetary Change* (1), *Quaternary Science Reviews* (1), *Science of the Total Environment* (1), *Paleoceanography and Paleoclimatology* (1), *Chemical Geology* (2), *Paleoecology Paleoclimatology Paleogeography* (1), *Earth's Future* (1), *Scientific Report* (1), *Applied Geochemistry* (1), *Journals of Asian Earth Sciences* (1), *Atmosphere* (2), *Soil Systems* (1), *Water* (1), *Forests* (1), *Vertebrate Paleobiology and Paleoanthropology Series* (1)

Communications Manager: GSA Soils and Soil Processes Division 2024

Convenor: AGU paleoclimatology and paleoceanography session 2023

Outstanding Student Presentation Award (OSPA) Liasion: AGU paleoclimatology and paleoceanography session 2023

Judge: Outstanding Student Presentation Award (OSPA) at AGU paleoclimatology and paleoceanography session 2023

Judge: the 13th Annual Jackson School of Geoscience Student Research Symposium 2024

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, built a soil CO₂ monitoring site in 2019 and accumulated hourly data for a whole year.

Xorkol Basin July 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

January 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