

金子梁 JIN Ziliang

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Research interests

- Derivation and migration of the primordial materials in the solar system
- The behaviors of volatiles during the formation of solar system bodies
- Development of matrix-matched reference materials used for high-precision SIMS measurements

Education

- 2014 – 2017 **Guest scientist** GeoForschungZentrum, Potsdam, Germany.
Co-Advisor: **Dr. Michael Wiedenbeck**
- 2012 – 2017 **Ph.D. candidate** China University of Geosciences, Beijing
Advisor: **Dr. Zhaochong Zhang**
- 2008 – 2012 **B.Sc. (Geology)** China University of Geosciences, Beijing

Professional appointment

- 2021 – **Assistant Professor**–Macao University of Science and Technology
- 2017 – 2020 **Postdoctoral scholar**–Arizona State University, Tempe, U.S.
Supervisor: **Dr. Maitrayee Bose**

Professional experiences

Macao University of Science and Technology, China (Since 2021)

- Managing: Laser ablation-inductive coupled plasma mass spectrometry (LA-ICP-MS). GeoLasHD + Agilent 7900.
- Simulating the hydration processes of the early solar system materials via ion implantation.
- Research on the loss of volatile elements of the Moon.

Arizona State University, Arizona, U.S. (2017-2020)

- Sustaining laboratory services: daily checking and maintaining, ordering and purchasing lab items, scheduling and executing.
- Development of key protocols for high-precision H measurement using the NanoSIMS 50L at ASU.
- Study of the hydrogen isotope systematics of nominally anhydrous minerals in the meteorite and asteroid samples by using SIMS instruments (NanoSIMS 50L and IMS 6f). (PI: Maitrayee Bose; Collaborator: Richard Hervig)

- Development of the Duoplasmatron and Cs ion sources on SIMS instruments. (Collaborator: Peter Williams)
- Assisting in building a Class 10000 clean lab at ASU (PI: Maitrayee Bose).
- Assisting in tuning and operating the NanoSIMS 50L:
 - Water contents and H isotopic compositions in NAMs from impacted Martian meteorites (PI: Anne Peslier).
 - Li diffusion in zircon (PI: Christy Till).
 - Li isotope systematics in coal (PI: Lynda Williams).
 - Searching and imaging of presolar grains in meteorites (PI: Maitrayee Bose).
 - C, O, and H isotopes in carbonates from carbonaceous chondrites (PI: Myriam Telus).
 - C-N isotopic distribution in bee's brain (PI: Tyler Quigley).
- Mentoring: Rithvik Musuku (high school student), preparation of Indium mounts for holding tiny interstellar dust particles (<10 µm).

GeoForschung Zentrum, Potsdam, Germany (2015-2017)

- SIMS reference material development: project planning and executing on synthetic silicate glass, synthetic olivine, and natural hornblende. (PI: Michael Wiedenbeck)
- Defining SIMS primary beam sputtering behaviors. (PI: Michael Wiedenbeck)
- The micro-analytical isotopic homogeneity characterization of existing certified O and C isotopic reference materials. (PI: Michael Wiedenbeck)
- SIMS Zircon U-Pb age and oxygen isotope determinations on tuff horizons from selected stratigraphic sections of the E'meishan Large Igneous Province, China. (PI: Zhaochong Zhang)

China University of Geosciences, Beijing, China (2012-2015)

- Study of metallogeny of Jinling skarn-type iron deposit in the North China Craton: Based on EMPA, ICPMS and LA-ICPMS analyses on the igneous rocks and altered minerals from Jinling skarn-type iron deposit in the North China Craton. (PI: Zhaochong Zhang)
- Study of the growth and evolution of continental crust in Central Tianshan area, Xinjiang, Northwest China: by field mapping and whole rock geochemistry and mineral chemistry analyses on igneous rocks. (PI: Zhaochong Zhang)

Grants

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- FDCT – 2021-2023 – **PI:** A comprehensive study of mineral disequilibrium in the achondrite EC002

Peer-reviewed articles (*corresponding author)

- **Z. Jin***, M. Bose, T. Lichtenberg, G. Mulders (2021), New evidence for wet accretion of inner solar system planetesimals from meteorites Chelyabinsk and Benenitra. *The Planetary Science Journal*, 2, 244.
- Q. Xie, Z. Zhang*, **Z. Jin***, M. Santosh, L. Han, K. Wang, P. Zhao, H. He (2021), The high-grade Fe skarn deposit of Jinling, North China Craton: Insights into hydrothermal iron mineralization. *Ore Geology Reviews*, 138, 104395.
- **Z. Jin*** and M. Bose (2021), Hydration of Nebular Minerals through the Implantation–Diffusion Process. *The Astrophysical Journal*, 913, 116.
- J. Zhu, Z. Zhang*, M. Santosh, **Z. Jin** (2020), Carlin-style gold province linked to the extinct Emeishan plume. *Earth and Planetary Science Letters*, 530: 115940.
- **Z. Jin*** and M. Bose (2019), New clues to ancient water on Itokawa. *Science Advances*, eaav8106.
- **Z. Jin**, Z. Zhang*, M. Santosh, L. Han (2018), Occurrence and chemical compositions of amphiboles in altered dioritic rocks of Laiwu skarn-type iron deposit in West Shandong area, China. *Resource Geology*, 68(4), 425-445.
- X. Fei, Z. Zhang*, Z. Cheng, M. Santosh, **Z. Jin**, B. Wen (2018) Highly differentiated magmas linked with polymetallic mineralization: A case study from the Cuihongshan granitic intrusions, Lesser Xing'an Range, NE China. *Lithos*, 302, 158-177.
- Q. Xie, Z. Zhang*, T. Hou, T., **Z. Jin**, M. Santosh (2017). Geochemistry and oxygen isotope composition of magnetite from the Zhangmatun deposit, North China Craton: Implications for the magmatic-hydrothermal evolution of Cornwall-type iron mineralization. *Ore Geology Reviews*, 88, 57-70.
- A. Ebey, Z. Cheng, **Z. Jin**, Z. Zhang* (2016). Genesis of mafic-ultramafic rocks in Ulan Obo of Sonid Left Banner, Inner-Mongolia: Indication for metallogenic potentiality. *Acta Petrologica Et Mineralogica*, 4, 002.
- **Z. Jin**, Z. Zhang*, M. Santosh, T. Hou, L. Han (2015), Genetic relationship of high-Mg dioritic pluton to iron mineralization: A case study from the Jinling skarn-type iron deposit in the North China Craton. *Journal of Asian Earth Sciences*, 113, 957-979.
- Q. Xie, Z. Zhang*, T. Hou, M. Santosh, **Z. Jin**, L. Han, Z. Cheng (2015), Petrogenesis of the Zhangmatun gabbro in the Ji'nan complex, North China Craton: Implications for skarn-type iron mineralization. *Journal of Asian Earth Sciences*, 113, 1197-1217.
- **Z. Jin**, Z. Zhang*, M. Santosh, H. Huang, T. Hou, Y. Ma (2014), Geochronology and geochemistry of the Airikenqiken granite, Central Tianshan Terrane, Xinjiang, China: implications for petrogenesis and continental growth. *International Geology Review*, 56, 801-822.
- Y. Ma, H. Huang, Z. Zhang*, **Z. Jin** (2014), Ore-formation process and prospective potential of the Airikenqiken Cu-Mo ore district in the West Tianshan Mountains, Xinjiang. *Acta Petrologica Et Mineralogica*, 1, 79-94.

Selected Conference Abstracts

- **Z. Jin** and M. Bose (2021), Hydration of Nebular Minerals through the Implantation-Diffusion Process. the Inaugural Chinese Planetary Science Conference (Invited talk).
- **Z. Jin** and M. Bose (2020), Effects of terrestrial contamination on bulk water contents in meteorites. Goldschmidt 2020 (Oral talk).
- **Z. Jin** and M. Bose (2020), Evidence of Nebular Water in Recent Ordinary Chondrite Falls Chelyabinsk and Benenitra. 51th Lunar and Planetary Science conference, No. 1470 (Oral talk).
- **Z. Jin** and M. Bose (2020), Implantation of Ionized Solar Nebular Hydrogen in Minerals. 51th Lunar and Planetary Science conference, No. 1250. (Poster).
- **Z. Jin** and M. Bose (2019), Hydrogen isotope systematics in ordinary chondrite parent bodies. 50th Lunar and Planetary Science conference, No. 1576. (Oral talk).
- **Z. Jin** and M. Bose (2018), Itokawa: a water-rich S-type asteroid. Hayabusa 2018: 6th Symposium of Solar System Materials. (Oral talk, funded by JAXA).
- **Z. Jin**, M. Bose, Z. Peeter (2018), New clues to ancient water on Itokawa. 49th Lunar and Planetary Science conference, #1670. (Oral talk)
- **Z. Jin** and M. Bose (2018), Water-rich S-type asteroid Itokawa. Goldschmidt 2018 conference.
- A. Rocholl, **Z. Jin**, S. Halas, M. Wiedenbeck (2018), The nanogram-scale heterogeneity of IAEA-CO-1 calcite, Geoanalysis 2018.
- M. Wiedenbeck and **Z. Jin** (2018), SIMS Analyses Employing a Flood Gas Tracer, Geoanalysis 2018.

Technical skills

- Operation on NanoSIMS 50L for isotopic analyses (e.g. H, Li, C, O, and S).
- Operation on Cameca SIMS-1280 HR for high precision isotopic analyses (e.g. U-Pb, O, B, and C).
- Operation on LA-ICPMS for Zircon U-Pb dating.
- Operation on Electronic Microprobe and Scanning Electron Microscope.
- Statistics of geochemical metrology.
- Preparation of samples for SIMS measurements (polishing, mounting, Au coating, optical microscope).

Service

- Reviewer for Mineralogy and Petrology and Ore Geology Reviews.
- Reviewer for NASA NSPIRES.

Selected Press Coverage & Media

- [EurekAlert!](#), “*ASU researchers find water in samples from asteroid Itokawa*”.

- [THE CONVERSATION](#), “*Asteroid dust brought back to Earth may explain where our water came from with hydrogen clues*”.
- [CNN](#), “*Water found in samples from the surface of an asteroid*”.
- [SPACE](#), “*Water Found in Tiny Dust Particles from Asteroid Itokawa*”.
- [Discover](#), “*Asteroids Delivered Half of Earth’s Water, New Sample Suggests*”.
- [LA VANGUADIA](#), “*Científicos encuentran agua en muestras del asteroide Itokawa*”. (In French)
- [AstroArts](#), “*イトカワのサンプル粒子から水を検出*”. (In Japanese)

Workshops

- Jan 3rd - 5th 2019: Secondary Ion Mass Spectrometry Workshop, Arizona State University, U.S.
- Jan 3rd - 5th 2018: Secondary Ion Mass Spectrometry Workshop, Arizona State University, U.S.
- Aug 3rd - 5th 2017: The 7th International NanoSIMS user meeting, Leipzig, Germany
- Nov 7th - 11th 2016: Introduction to Secondary Ion Mass Spectrometry in the Earth Sciences, GeoForschung Zentrum, Germany

Language skills

- Chinese (first language)
- English (fluent)
- German (proficient)