



Research Field: Cosmochemistry

Focused Field: Geochemistry and Mineralogy of Planetary Aquatic Systems



SHORT BIO

I Start my research career as a PhD candidate in Guangzhou Institute of Geochemistry, Chinese Academy of Sciences in 2014, under the supervision of Prof. Runliang Zhu. In 2018, I went to Virginia Tech as a joint PhD student, working with Prof. Michael F. Hochella. After I got the PhD degree in 2019, I continue worked as a post-doctoral fellow at GIG. In 2021, I joined the State Key Laboratory of Lunar and Planetary Science in Macau University of Science and Technology as an assistant professor.

Asst. Prof.

Jing Liu

劉晶



PhD: 2014-2019, Mineralogy, Petrology, Mineral deposits – Guangzhou Institute of Geochemistry, CAS

Degree: 2010-2014, Environmental Science – Xiangtan University

TEACHING Earth Sciences , Stone Culture and Mineralogy

RESEARCH INTEREST

My research investigates planetary geochemical evolution through crystal nucleation/growth, redox chemistry, and mineral interfacial processes. Using advanced techniques (e.g., TEM, SEM, IR, Raman), I analyze natural samples (e.g., meteorites, Mars analogues) and simulated products to address the following themes:

- 1) Simulate mineral alteration under Mars-like conditions (e.g., freeze-thaw, light-irradiation, hydrothermal systems) to decode redox and hydrologic history, aiding rover data interpretation.
- 2) Characterize the chemistry and mineralogy of meteorites and Mars analogues to unravel the paleoenvironment.
- 3) Investigate the nucleation, phase transformation, and crystallization of nanominerals, linking atomic-scale mechanisms to global biogeochemical cycles of key elements.

PROFESSIONAL EXPERIENCE

Ongoing – 2021 – Macau University of Science and Technology, Macao (China) – Assistant Professor

2021 – 2019 – Guangzhou Institute of Geochemistry, Chinese Academy of Sciences (China) – Post Doctoral

2018 – 2017 – Virginia Polytechnic and State University (USA) – Joint Doctoral Student

SERVICE

Reviewer of Environmental Science & Technology, Ore Geology Reviews , Clay and Clay minerals, etc.

GRANTS

The Science and Technology Development Fund of Macau 0062/2024/ITP2, 2025.01-2026.12, **PI**

The National Natural Science Foundation of China (NSFC) Youth Project 42302033, 2023.1~2025.12, **PI**

The Science and Technology Development Fund of Macau 0070/2022/A, 2022.12-2024.12, **PI**

Faculty Research Grants of the Macau University of Science and Technology, 2022.5~2023.5, **PI**

Open Project of Guangdong Key Laboratory of Mineral Physics and Material Development, 2021-2023, **PI**

China Postdoctoral Science Foundation, 2019-2021, **PI**

KEY PUBLICATIONS

(Selected, Full publication please refer to WWW.RESEARCHGATE.NET/PROFILE/JING-LIU-62)

Tong, S., Wei, H., Zhou, J., Yang, Y., Zhu, R.,* Chen, Q., Xie, X., Hu, Q., Hochella, M.F. *, **Liu, J***, **2025**, Atomic Insights into the Heterogeneous Crystallization of Manganese (Oxyhydr)oxides on Typical Iron (Oxyhydr)oxides: from Adsorption to Oxidation to Crystallization, *Environmental Science & Technology*

Wei, H., Wei, S., Chen, Q.*, Yang, Y., Liu, X., Long, S., **Liu, J.***, Zhu, J., Zhu, R., **2025**, Nano-Scale Insights into Clay Minerals Regulating the Fe(II)-Catalyzed Ferrihydrite Transformation under Anoxic Conditions, *Environmental Science & Technology*.

Liu, J., Zhou, J. * Jiang, X., Wei, Z., Yang, S., **2024**, Formation of authigenic titania during the alteration of volcanic glasses in modern deep-sea environments. (2024), *Geochimica et Cosmochimica Acta*.

Liu, J., Chen, Q., Yang, Y., Wei, H., Laipan, M., Zhu, R.*, He, H., Hochella, F. M.* **2022**, Coupled redox cycling of Fe and Mn in the environment: The complex interplay of solution species with Fe-and Mn-(oxyhydr) oxide crystallization and transformation. *Earth-Science Reviews*

Liu, J., Inoué, S., Zhu, R.* , He, H., Hochella, F. M.* **2021**, Facet-specific oxidation of Mn(II) and heterogeneous growth of manganese (oxyhydr)oxides on hematite nanoparticles. *Geochimica et Cosmochimica Acta*.

Liu, J., Zhu, R.* , Ma, L., Fu, H., Lin, X., Parker, S.C., Molinari, M. **2021**, Adsorption of phosphate and cadmium on iron (oxyhydr)oxides: A comparative study on ferrihydrite, goethite, and hematite. *Geoderma*

Liu, J., Zhu, R.* , Chen, Q., Zhou, H., Liang, X., Ma, L., Parker, S.C. **2019**, The significant effect of photo-catalyzed redox reactions on the immobilization of chromium by hematite. *Chemical Geology*

RECENT NEWS OF OUR GROUP

2025. 02 - Freeze-thaw machine is installed, our FT cycling experiments can be more labor saving.

2025. 02 - The first research paper of Tong Shouhao is published on EST! It's about the heterogeneous crystallization of manganese oxides, the research topic of his Master's thesis.

2024. 12 - The Fumehood has been installed (procured at the end of 2021), and we can use the photoreactor to do experiments without worrying about the ozone production.

2024. 11 - Mike visit China! Haven't seen him for 7 years since I left the US. An important scientist that has influenced my research career.

2024. 10 - We publish a GCA paper about the formation of authigenic titania during the alteration of volcanic glasses in modern deep-sea. The first time I have tried the analysis of a natural sample.

2024. 07 - Congrats! Liang Xiaonan and Wang Jing successfully pass the master thesis defense, and they both get A! Wish them all the best in the future.

2023. 10 - Master student Luo Mengqi join our group, she will study on vivianite oxidation, an important phosphate mineral.

2023. 07 - Tong Shouhao successfully get his master degree and will continue work in our group as PhD candidate. Prof. Zhu Runliang come to be the chairman of the defense committee!