

CURRICULUM VITA

YUYAN (SARA) ZHAO

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ACADEMIC EXPERIENCE

2014/08	Ph.D., Stony Brook University (Geoscience)
2006/06	M.S., Sun Yat-sen University, China (Geochemistry)
2004/06	B.S., Sun Yat-sen University, China (Geology)

POSITIONS HELD

2025/07 – 2026/01	Associate Dean, International Education College, Chengdu University of Technology
2024/03 – 2025/07	Deputy Dean, College of Earth and Planetary Sciences, Chengdu University of Technology
2022/12 - Present	Professor, Research Center for Planetary Science, Chengdu University of Technology
2019/07 - Present	Research Fellow, CAS Center for Excellence in Comparative Planetology
2015/07 – 2022/10	Associate Research Fellow Institute of Geochemistry Chinese Academy of Sciences
2008/09 – 2014/08	Research Assistant, Stony Brook University
2007/09 – 2008/08	Teaching Assistant, Stony Brook University

ACADEMIC ACTIVITIES

2025 – Present	Executive Editor, <i>Planet</i>
2023 – Present	Editorial Board Member, <i>Acta Geochemica</i>
2021 – Present	Member, Youth Working Committee, 10th Council of the Chinese Society for Mineralogy, Petrology and Geochemistry
2021 – Present	Council Member, Chinese Society of Space Science
2021 – Present	Council Member, Youth Planetary Forum
2020 – Present	Council Member, Youth Geoscience Forum
2020 – Present	Member, Scientist Team of China's First Mars Exploration Mission (TW-1)

TEACHING COURSES

- Introduction to Mars Science
- Introduction to Lunar and Martian Sciences

- Frontiers in Martian Geology
- Planetary Geology
- Planetary Surface Science
- Planetary Field Training
- Introduction to the Planetary Science Major

PROJECT PARTICIPATION

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| 2026 – 2030 | National Natural Science Foundation of China (NSFC) Young Scientists Fund (Category A): Sedimentary Geochemistry of Mars, Principal Investigator , ¥4.00 million (Ongoing) |
| 2025 – 2028 | National Natural Science Foundation of China (NSFC) Key Special Project, <i>Pedogenic Mechanisms and Secondary Modification Effects of Martian Soil</i> (Grant No. 42441803), Principal Investigator , ¥2.56 million (Ongoing) |
| 2024 – 2027 | National Natural Science Foundation of China (NSFC) General Program, <i>Experimental Study on Key Factors Controlling the Formation and Transformation of Iron Secondary Minerals in Martian Frozen Environments</i> (Grant No. 42373042), Principal Investigator , ¥0.55 million (Ongoing) |
| 2020 – 2024 | Chinese Academy of Sciences (CAS) Strategic Priority Research Program (Category B), <i>Formation, Evolution, and Habitability of Terrestrial Planets</i> (Grant No. XDB41000000), Subproject: <i>Sedimentary Environments and Evolution on Ancient Mars</i> , Subproject PI , ¥2.0 million (Completed) |
| 2020 – 2022 | Civil Aerospace Pre-research Project of the China National Space Administration, <i>Composition, Soil Characteristics, and Geological Evolution of the Mars Landing Site</i> (Grant No. D020102), Co-PI, Responsible for Funding , ¥1.0 million (Completed) |
| 2017 – 2020 | National Natural Science Foundation of China (NSFC) General Program, <i>Experimental Study on the Influence of Chlorine and Bromine on Jarosite Crystal Chemistry and Dissolution Rates in Martian Sedimentary Rocks</i> (Grant No. 41673072), Principal Investigator , ¥0.72 million (Completed) |

RESEARCH INTERESTS

Planetary Exploration and Planetary Surface Geological Evolution

- Ancient Martian Sedimentary Processes and Evolution of Sedimentary Environments
- Volatile Distributions and Cycling on Mars
- Preservation Potential and Detection of Organic Matter and Biosignatures
- Characteristics and Evolution of the Planetary Cryosphere
- Experimental geochemistry; Aqueous geochemistry and geochemical thermodynamics

PUBLICATIONS (FIRST AUTHOR / CORRESPONDING AUTHOR*)

1. Rui Chang & **Yu-Yan Sara Zhao***. (2025) Halogen partitioning and structural incorporation in K- and Na-jarosite: Experimental insights under Mars-relevant conditions. *Planet.* 1, 25003. <https://doi.org/10.15302/planet.2025.25003>
2. Kairui Tai, **Yu-Yan Sara Zhao***, Youjun Zhang, Wenhao Song, Yazhou Yang, Mengyuan Zhang, Chao Qi, Wei Du, Fengke Cao, Runlian Pang, Zongjun Yin, Yun Liu. (2025) Shock effects of Fa₅₀ iron-rich olivine: Spectral and microstructural implications for Mars and Phobos. *Astronomy & Astrophysics.* 699, A84. <https://doi.org/10.1051/0004-6361/202554497>
3. Shuai-Yi Qu, **Yu-Yan Sara Zhao***, He Cui, Shuai Zhang, Honglei Lin, Chao Qi, Xiongyao Li, Jianzhong Liu. (2025) Preferential formation and efficient preservation of perchlorate with iron salts on the Martian surface. *Journal of Geophysical Research: Planets.* 130, e2024JE008688. <https://doi.org/10.1029/2024JE008688>
4. Yan Zhou, **Yu-Yan Sara Zhao***, Xiaoting Xu, Yiran Wang. (2025) Characteristics and Climatic Indications of Ice-Related Landforms at Low Latitudes (0°–±30°) on Mars. *Remote Sensing*, 17(11): 1939. <https://doi.org/10.3390/rs17111939>
5. Bohao Chen, Xiao-Wen Yu, **Yu-Yan Sara Zhao***, Di-Sheng Zhou, Shuai-Yi Qu, Jiannan Zhao*, Chao Qi, Xiongyao Li, Jianzhong Liu. Preservation Potentials of Siderite in Low-Temperature Brines Relevant to Mars. *Journal of Geophysical Research: Planets*, 129, e2023JE008250. <https://doi.org/10.1029/2023JE008250>
6. Jun-Feng Chen, **Yu-Yan Sara Zhao***, Qiao Shu, Sheng-Hua Zhou, Wei Du, Jing Yang. (2024) The oxygen fugacity of intermediate shergottite NWA 11043: implications for Martian mantle evolution, *Geochimica et Cosmochimica Acta*, 375, 90-105, doi:10.1016/j.gca.2024.05.008.
7. Jiamei Li, **Yu-Yan Sara Zhao***, He Cui, Shuai-Yi Qu, Yanhua Peng, Yuhong Yang & Xiongyao Li. Experimental constraints on the formation of oxychlorine species by UV irradiation and mechanical pulverization on the lunar surface. *Acta Geochimica* (2024), doi:10.1007/s11631-024-00707-0.
8. Di-Sheng Zhou, Xiyu Wang, **Yu-Yan Sara Zhao***, Weiqiang Li, Junhu Wang, Dongdong Li, Zongcheng Ling, Yang Li, Xiongyao Li, and Jianzhong Liu. (2023) Photooxidation of Evaporative Ferrous-Ferric Sulfate Brines under a Martian CO₂ Atmosphere, *ACS Earth and Space Chemistry*, 2024, 8, 1, 54–66, doi:10.1021/acsearthspacechem.3c00164
9. Beiyi Zhang, Chen Sun*, Xiao-Wen Yu, Fengye Chen, Li Wang, Yunfei Rao, Tianyang Sun, **Yu-Yan Sara Zhao***, Jin Yu*. (2023) Sensitive and accurate determination of nitrogen in simulated Martian soil and environment with LIBS spectrum fusion and regression based on neural network, *Spectrochimica Acta Part B: Atomic Spectroscopy*, 106708, doi:10.1016/j.sab.2023.106708

10. **Yu-Yan Sara Zhao***, Jin Yu*, Guangfei Wei, Lu Pan, Xiangfeng Liu, Yangting Lin, Yang Liu, Chen Sun, Xiyu Wang, Juntao Wang, Weijie Xu, Yunfei Rao, Weiming Xu*, Tianyang Sun, Fengye Chen, Beiyi Zhang, Honglei Lin, Zhenqiang Zhang, Sen Hu, Xiang-Yu Li, Xiao-Wen Yu, Shuai-Yi Qu, Di-Sheng Zhou, Xing Wu, Xiaojia Zeng, Xiongyao Li, Hong Tang, Jianzhong Liu*. (2023) In situ analysis of surface composition and meteorology at the Zhurong landing site on Mars, *National Science Review*, <https://doi.org/10.1093/nsr/nwad056>
11. Shan-shan Zhong, **Yu-Yan Sara Zhao***, Honglei Lin, Rui Chang, Chao Qi, Junhu Wang, Bing Mo, Yuanyun Wen, Wen Yu, Di-sheng Zhou, Xiaowen Yu, Xiongyao Li, Jianzhong Liu. (2023) High-temperature oxidation of magnesium- and iron-rich olivine under a CO₂ atmosphere: Implications for Venus. *Remote Sensing*, 15, 1959. doi:10.3390/rs15081959
12. Jingyan Xu, Bing Mo, Yanxue Wu, **Yu-Yan Sara Zhao***, Honglei Lin, Binlong Ye, Joseph Michalski, Yang Li, Kairui Tai, Chen Li, Zhuang Guo, Chao Qi, Shen Liu*, Xiongyao Li, Jianzhong Liu. (2023) Space weathering effects and potential spectral alteration on Phobos and the Moon: Clues from the Fe content of olivine. *Astronomy & Astrophysics*, doi: 10.1051/0004-6361/202245453
13. Xiao-Wen Yu, **Yu-Yan Sara Zhao***, Yanxue Wu, Chao Qi, Dongdong Li, Honglei Lin, Shiling Yang, Jianzhong Liu, Xiongyao Li. (2023). Cryogenic sulfuric weathering and challenges for preserving iron-rich olivine on cold and icy Mars. *Journal of Geophysical Research: Planets*, 127, e2022JE007593, doi:10.1029/2022JE007593
14. Di-Sheng Zhou, Xiao-Wen Yu, Rui Chang, **Yu-Yan Sara Zhao***, Xiongyao Li, Jianzhong Liu, Honglei Lin, Chao Qi. (2022) Effects of formation pathways and bromide incorporation on jarosite dissolution rates: Implications for Mars. *Journal of Geophysical Research: Planets*, 127, e2022JE007202, doi:10.1029/2022JE007202
15. Shuai-Yi Qu, **Yu-Yan Sara Zhao***, He Cui, Xiu-Zhen Yin, W. Andrew Jackson, Xin Nie, Zhong-Chen Wu, Jun-Hu Wang, Di-Sheng Zhou, Chao Qi, Xiong-Yao Li, Jian-Zhong Liu. (2022) Preferential formation of chlorate over perchlorate on Mars controlled by iron mineralogy. *Nature Astronomy*, 6, 436–441, doi:10.1038/s41550-021-01588-6
16. Dongdong Li, **Yu-Yan Sara Zhao***, Pierre-Yves Meslin, Margaux Vals, François Forget, Zhongchen Wu. (2022) Cryogenic origin of fractionation between perchlorate and chloride under modern Martian climate. *Communications Earth & Environment*, 3, 15, doi:10.1038/s43247-022-00345-5
17. Xiyu Wang, **Yu-Yan Sara Zhao***, Don R. Hood, Suniti Karunatillake, Dara Laczniak, Mariek E. Schmidt, Meththika Vithanage. (2021). Multiphase volatilization of halogens at the soil-atmosphere interface on Mars. *Journal of Geophysical Research: Planets*, 126, e2021JE006929, doi: 10.1029/2021JE006929.
18. **Yu-Yan Sara Zhao***, Scott M. McLennan, W. Andrew Jackson, Suniti Karunatillake. (2018).

Photochemical controls on chlorine and bromine geochemistry at the Martian surface. *Earth and Planetary Science Letter*, 497, doi: 10.1016/j.epsl.2018.06.015.

19. **Yu-Yan Sara Zhao***, Scott M. McLennan, Martin A. A. Schoonen. (2014). Behavior of bromide, chloride and phosphate during low temperature aqueous Fe(II) oxidation processes on Mars. *Journal of Geophysical Research: Planets*, 119 (5): 998-1012.
20. **Yu-Yan Sara Zhao*** and Scott M. McLennan. (2013). Behavior of Ni, Zn and Cr during low temperature aqueous Fe oxidation processes on Mars. *Geochimica et Cosmochimica Acta*, 109: 365-383.

PUBLICATIONS (CO-AUTHOR)

1. Qi Sun, **Yu-Yan Sara Zhao**, Kesong Ni, Zonghao Wang, Wen Yu, Wenqi Luo, Wenbin Yu, Xin Nie, Zonghua Qin, Quan Wan* (2025). Melting of phyllosilicates and evolution of impact glasses in simulated cratering events. *Journal of Geophysical Research: Planets*, 130, e2025JE009023. <https://doi.org/10.1029/2025JE009023>
2. Zengqian Hou*, Jizhong Liu*, Fuchuan Pang*, Yuming Wang*, Yiliang Li, Mengjiao Xu, Jianya Gong, Kun Jiang, Zhizhong Kang, Yangting Lin, Jia Liu, Yang Liu, Yang Li, Liping Qin, Zhenfeng Sheng, Chi Wang, Juntao Wang, Guangfei Wei, Long Xiao, Yigang Xu, Bingkun Yu, Renhao Ruan, Chaolin Zhang, **Yu-Yan Sara Zhao** & Xin Zou. (2025) In search of signs of life on Mars with China's sample return mission Tianwen-3. *Nature Astronomy*, 9, 783–792. <https://doi.org/10.1038/s41550-025-02572-0>
3. Yucong Jin, Fengye Chen, Chen Sun*, Beiyi Zhang, Yunfei Rao, Tianyang Sun, Ding Li, Haoyu Yang, Li Wang, **Yu-Yan Sara Zhao**, Olivier Forni, Agnès Cousin, Sylvestre Maurice, Jin Yu*. (2025) A matrix-insensitive classification of carbon-containing organic compounds via silhouette-optimized feature selection and neural network, *Spectrochimica Acta Part B: Atomic Spectroscopy*, 107252. <https://doi.org/10.1016/j.sab.2025.107252>
4. Xiaoting Xu, Yi Xu*, Zhuo Han, HonKuan Wong, Xu Meng, **Yu-Yan Sara Zhao**, Roberto Bugiolacchi, Shuanggen Jin (2025). Shallow water ice detection from SHARAD data in central Utopia Planitia, Mars. *Journal of Geophysical Research: Planets*, 130, e2023JE008145, doi:10.1029/2023JE008145
5. Zengqian Hou*, Jizhong Liu*, Yigang Xu, Fuchuan Pang*, Yuming Wang*, Liping Qin, Yang Liu*, **Yu-Yan Sara Zhao**, Guangfei Wei, Mengjiao Xu, Kun Jiang, Chuanpeng Hao, Shichao Ji, Renzhi Zhu, Bingkun Yu, Jia Liu, Zhenfeng Sheng, Juntao Wang, Chaolin Zhang, Yiliang Li. (2024) The search for life signatures on Mars by the Tianwen-3 Mars sample return mission, *National Science Review*, 11(11), nwae313, doi:10.1093/nsr/nwae313
6. Ziyu Wang, Honglei Lin*, Binlong Ye, **Yu-Yan Sara Zhao**, Chao Qi, Jingyan Xu, Yong Wei. (2024) Near-infrared spectral behavior of space-weathered olivine with varying iron content, *Astronomy & Astrophysics*, 690, A138, doi: 10.1051/0004-6361/202450888

7. Liang Ding*, Ruyi Zhou, Tianyi Yu, Huaiguang Yang, Ximing He, Haibo Gao*, Juntao Wang, Ye Yuan, Jia Wang, Zhengyin Wang, Huanan Qi, Jian Li*, Wenhao Feng, Xin Li, Chuankai Liu, Shaojin Han, Xiaojia Zeng, **Yu-Yan Sara Zhao**, Guangjun Liu, Wenhui Wan, Yuedong Zhang, Saijin Wang, Lichun Li, Zongquan Deng, Jianzhong Liu*, Guolin Hu, Rui Zhao & Kuan Zhang. (2024) Lunar rock investigation and tri-aspect characterization of lunar farside regolith by a digital twin. *Nature Communications*, 15, 2098, doi:10.1038/s41467-024-46233-8
8. Lei Zhang, Chao Li, Jinhai Zhang*, Bin Zhou, **Yu-Yan Sara Zhao**, Yang Liu, Kaichang Di, Ross N. Mitchell, Juan Li, Zhigang Zhang, Lin Chen, Xiaofeng Liang, Weijia Sun, Yike Liu, Xu Zhao, Jinlai Hao, Changyi Xu, Yikang Zheng, Yibo Wang, Xin Wang, Pan Zhao, Wenmin Lv, Yang Li, Haiqiang Lan, Yuxi Li, Wei Wang, Yang Lu, Honglei Lin, Peng Fang, Wei Lin, Yong Wei, Ling Chen, Guangyou Fang, Yangting Lin, Zhenxing Yao & Yongxin Pan. (2024) Buried palaeo-polygonal terrain detected underneath Utopia Planitia on Mars by the Zhurong radar. *Nature Astronomy*, 8, 69–76, doi:10.1038/s41550-023-02117-3
9. Fengye Chen, Chen Sun, **Shuaiyi Qu**, Beiyi Zhang, Yunfei Rao, Tianyang Sun, **Yu-Yan Sara Zhao**, Jin Yu. (2024) Determination of inorganic and organic carbons in a Martian soil simulant under the Martian CO₂ atmosphere using LIBS coupled with machine learning, *Spectrochimica Acta Part B: Atomic Spectroscopy*, 214, 106887, doi:10.1016/j.sab.2024.106887.
10. Yunfei Rao, Chen Sun, Xiaowen Yu, Fengye Chen, Li Wang, Beiyi Zhang, Tianyang Sun, Cong Liu, Jinbo Qiu, **Yu-Yan Sara Zhao**, Jin Yu. (2024) Precise chlorine determination in geological materials using LIBS coupled with stable learning for Mars explorations, *Spectrochimica Acta Part B: Atomic Spectroscopy*, 213, 106881, doi:10.1016/j.sab.2024.106881.
11. Yang Liu*, Xing Wu, **Yu-Yan Sara Zhao**, Lu Pan, Chi Wang, Jia Liu, Zhenxing Zhao, Xiang Zhou, Chaolin Zhang, Yuchun Wu, Wenhui Wan, Yongliao Zou. (2022). Zhurong reveals recent aqueous activities in Utopia Planitia, Mars. *Science Advances*, 8(19), doi: 10.1126/sciadv.abn8555.
12. L. Ding*, R. Zhou, T. Yu, H. Gao*, H. Yang, J*. Li, Y. Yuan, C. Liu, J. Wang, **Yu-Yan Sara Zhao**, etc. (**total 48 coauthors**). (2022). Surface characteristics of the Zhurong Mars rover traverse at Utopia Planitia. *Nature Geoscience*, 15, 171–176 (2022), doi.org/10.1038/s41561-022-00905-6
13. Xiaojia Zeng, Yanxue Wu, **Yu-Yan Sara Zhao**, Runlian Pang, Bing Mo, Yuanyun Wen, Xiongyao Li, Jianzhong Liu (2021). Revealing high-manganese material on Mars at microscale. *Geophysical Research Letters*, 48, e2021GL093410, doi:10.1029/2021GL093410.
14. Giacomo Certini, Suniti Karunatillake, **Yu-Yan Sara Zhao**, et al. (2020) Disambiguating the soils of Mars. *Planetary and Space Science*, 186, doi: 10.1016/j.pss.2020.104922.

15. Alian Wang, Pablo Sobron, Fanjing Kong, Mianping Zheng, **Yu-Yan Sara Zhao**. (2018). Dalangtan saline playa in a hyperarid region on Tibet Plateau-II: preservation of salts with high hydration degrees in subsurface. *Astrobiology*, 18, doi: 10.1089/ast.2018.1829.
16. Marcella Yant, A. Deanne Rogers, Hanna Nekvasil, **Yu-Yan Sara Zhao**, Tom Bristow. (2016). Spectral characterization of acid weathering products on martian basaltic glass, *Journal of Geophysical Research: Planets*, 121, doi: 10.1002/2015JE004969.
17. Suniti Karunatillake, **Yu-Yan Sara Zhao**, Scott M. McLennan, J.R. Skok, Nicole E. Button. (2013). Does martian soil release reactive halogens to the atmosphere? *Icarus*, 226 (2): 1438-1446.