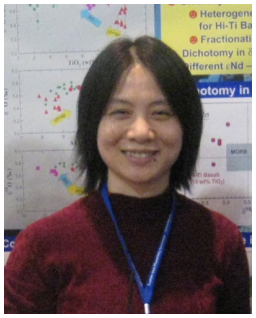
Curriculum Vitae



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Education

The University of Michigan
Ph.D. Geology, April 2003
M.S., Geology, December 1998

Chengdu University of Technology
B.S., Petroleum, July 1995

Position Held

NASA Jet Propulsion Laboratory, California Institute of Technology
Science Division, Planetary Geology Group
Planetary Scientist, Nov. 2012 - present
Senior Research Scientist, May 2025 – present
Group supervisor, Feb. 2022 – Oct. 2025
Division Safety Representative, Oct. 2019 - Aug. 2023

California Institute of Technology
Division of Geophysics and Planetary Geosciences
Visiting Associate, Nov. 2012-present
Lecturer, *Spring, 2013-2015*

University of Tennessee
Department of Earth and Planetary Sciences, Planetary Geosciences Institute
Research Assistant Professor, Jan. 2010-Oct. 2012
Post-Doctoral Researcher, May 2005-Dec. 2009

University of Chicago
Department of Geophysical Sciences
Post-Doctoral Researcher, *Jan. 2003-April 2005*

Mission Involvement

Artemis III Geology Team

Co-investigator, Nov 2023 to present
Sample activity lead. Sample integrity and preliminary examination teams.
Supported planning and simulations of surface operations.

Mars 2020

Investigation Scientist, 2014-2020, *the Planetary Instrument for X-ray Lithology (PIXL)*

Supported instrument development from selection to delivery, including reviews of all key decision points (preliminary design review, critical design review, and instrument delivery review).
Gained first-hand experience in requirement writing and associated verification and validation. Led the development of the flight calibration target and supported the XRF calibration.
Main contributor to the definition of verification and validation for elemental calibration and key scientific functionalities.
Supported Mars 2020 Science Office from Phase A to D.

Co-investigator, *the Planetary Instrument for X-ray Lithology (PIXL), 2020-present*
Support surface operation and scientific interpretation of data.
Science lead for the multispectral calibration of the micro-context-camera using color LEDs.

Return Sample Planning Experience

KISS Workshop: Sample return from all across the Solar System
Study team member 2024-2025
Evaluating the science case for, and feasibility of, returning samples from planetary bodies across the Solar System.

MSR Sample Receiving Project Measurement Definition Team
Member, Oct 2023-Sept 2024
Evaluating and recommending measurements and types of instruments of Mars returned sample during the initial examination and characterization phase, including important science investigations that are sterilization- and time-sensitive.

MSR Science Planning Group
MRSH Implementation Planning Scientist, 2019
Developed a method to evaluate science investigations that need to be performed in containment, which formed the basis for assessing scientific measurements and implementation strategies
Participated in discussion regarding contamination control in returned sample handling
Re-evaluated sample mass estimates for measurements
Contributed to the planning of two successful workshops relating to science in containment and contamination control, writing the reports, and the Mars return sample management plan
Conducted exercise to evaluate implementation strategies of recommended measurements in sample returning facility

New Frontier MoonRise
Deputy Project Scientist, 2015-2017
Reassessing the sampling requirement for science goals/objectives, Assisting the STM and proposal development.

MSR Sample Quality Requirements
Sample scientist, 2012-2014
Developed a matrix to evaluate required sample qualities (integrity, inorganic contamination, magnetic, temperature, radiation) in the measurements of returned samples
Supported a working group in drafting recommendations of sample quality requirements for overall Mars return sample missions
Assessed effects of individual missions on sample quality and workflow of samples in a sample return facility
Co-organized workshop at the 2014 LPSC and presented working group findings at GSA, MEPAG, and 8th iMars conference which received positive feedback from the scientific community

The final recommendations of sample quality requirements were adapted for Mars 2020 sample caching system

Research Experience

- *Expertise*: Mineralogy, petrology, petrography, stable isotope, and trace element geochemistry.
- *Planetary samples*: ~ 20 years' experience working with small, precious samples, such as individual mineral grains, Apollo rocks, glasses, soils and meteorites that require special handling and processing considerations to minimize terrestrial contamination.
- *Microbeam techniques on polished samples:* Expert in microbeam techniques including scanning electron microscopy (SEM), electron probe micro-analyzer (EPMA), Secondary Ion Mass Spectrometry (SIMS), laser ablation inductively-coupled plasma mass spectrometry (LA-ICP-MS). Specifically, established SIMS procedure for D/H analysis of Apollo and martian samples that minimize terrestrial contamination.
- *Other analytical techniques*: In-depth knowledge of micro-XRF, IR/Raman spectroscopy, powder X-ray diffraction (XRD), Computed X-ray Tomography. Familiarity with the transmission electron microscope (TEM) for nano-scale imaging and synchrotron X-ray absorption.
- *Experimental Apparatus:* Setup and calibration of a rapid-quench cold-seal pressure vessel (TZM bomb), involving high-pressure gas system; frequent use of cold-seal vessels and internally heated pressure vessels.
- *Instrument development:* Investigation Scientist for Mars 2020 PIXL (micro-XRF) from Phase A to D; Co-I on DALI: Tunable Laser Spectrometer for lunar water, Raman, Sampling system.

Leadership

Group Supervisor, JPL	Feb 2022-Oct 2025
Vice Chair, ExMAG	Apr 2024-present

Services

NASA:	Panelist and reviewer for multiple NASA ROSES and CAN programs, & Judge for NASA Centennial Challenge (Sample Return Robot)
European Research Council	External Reviewer
Guest Associate Editor:	Geochimica et Cosmochimica Acta, JGR-Planet
Editor:	Minerals (2020-2023)
Journal Reviewers:	Annals of Geophysics, American Mineralogist, Bulletin of Volcanology, Chemical Geology, Contributions to Mineralogy and Petrology, Geochimica et Cosmochimica Acta, Geology, Icarus, International Geology Review, Journal of Geology, JGR, Journal of Volcanology and Geothermal Research, Meteoritics & Planetary Science, Minerals, Nature/Science journals, Planetary and Space Science, X-ray Spectrometry.
Conveners:	Southeastern GSA 2006; Western Pacific Geophysics Meeting 2006, Goldschmidt 2010, 2014; GSA 2013.
Program Committee:	8th International Mars conference; 86th Annual meeting of the Meteoritical Society in UCLA
Extraterrestrial Material Assessment Group (ExMAG)	Mars Subcommittee US-Chair (2023 to present) Vice Chair (2024 to present)
MetSoc Joint Publication Committee	Jan 2025-Dec 2027

Professional Association

Mineralogical Society of America, The Meteoritical Society, American Geophysical Union

Awards and Honor

2025	JPL Senior Research Scientist
2023	JPL Ed Stone Award
2023	NASA Software of the Year Award Runner-up: PIXLISE + PIQUANT
2016, 2020-2025	Multiple Voyager Awards, JPL
2022-2023	Multiple Mars 2020 Group Achievement Awards (Mars 2020 Pre-landing Strategic Science Group; Mars 2020 JPL Surface Operation Team -2021, 2022; Mars 2020 Instrument Operation Development Team; Mars 2020 PIXL Surface Op team; Mars 2020 Science Team)
2020	Mars 2020 PIXL bonus Awards
2020	NPR interview
2017	Discovery Channel Film on Volcanoes in the Solar System
2016	JPL NASA profile interview
2016	Mars Exploration Science Support Team Award, JPL
2016	PIXL Instrument Team Award
2014	Mariner Award, JPL
1998-2001	Three Turner Awards, Department of Geological Sciences, University of Michigan, Ann Arbor, MI
1992-1994	Excellent Academic Achievement Award, Chengdu University of Technology

Invited Talks

- Panelist for "Doing Science with Samples from Space" in the 2024 Space Symposium
- UCLA Geochem Colloquium, Feb 2024
- 16th Biennial Australian Microbeam Analysis Symposium, Brisbane, Australia, Feb 2024
- SSERVII CASA Moon Symposium, Feb 2024
- Goldschmidt 2023, Lyon France July 2023
- University of Nevada, Las Vegas, September, 2021
- University of Arizona, Oct 2020
- University of Michigan, Earth and Environmental Sciences, Smith Lecture, September, 2019
- Geological Society of America, Seattle, WA, "T198. Apatite As a Versatile Tool for Enabling Planetary Science", Oct 22-25, 2017
- Geological Society of America, Boulder, Colorado, "Volatiles & Magma Ascent Rates", Oct., 2014
- University of California, San Diego: "Some New Constraints on Martian Meteorites", Oct., 2013
- Caltech: "Water on the Moon", Feb., 2013
- Goldschmidt 2012: "Water , Water, Everywhere on the Moon", June 2012
- Geological Society of America, Boulder, Colorado, "Volatiles & Magma Ascent Rates", Nov. 2010
- East Tennessee Geological Society, Knoxville, "Water on the Moon", Nov. 2010
- Tennessee Technology Society, Knoxville, "Water on the Moon", Oct. 2010
- University of Tennessee, Knoxville, Earth & Planetary Science Department, "Water on the Moon", Sept. 2010
- University of Tennessee, Knoxville, Earth & Planetary Science Department, "Volatiles in Silicate Melts and Volcanic Eruptions", Jan. 2007

Outreach

- 2019 Speaker at the Project Scientist Academy (K-12)
- 2019 Speaker at the Chinese Parents Booster Club, Arcadia High School
- 2018 Support the Science and Engineering Booth at the STEAM Fair at Arcadia High School
- 2017 Led hiking event for Knox Presbyterian
- 2013 Volunteer, Door of Hope

New Minerals

1) Ma, C., **Liu, Y.**, and Tschauner, O. (2013). Tissintite. *IMA 2013-027. CNMNC Newsletter No. 16, Aug. 2013, Page 2707; Mineralogical Magazine, 77, 2695-2709.*
2) Tschauner, O., Ma, C., and **Liu, Y**. (2013). Ahrensite. *IMA 2013-028. CNMNC Newsletter No. 16, Aug. 2013, Page 2707; Mineralogical Magazine, 77, 2695-2709.*

New Meteorite Classified

1) **Liu, Y. (2016)** NWA 10553, brecciated eucrite, *Meteorite Bulletin, 105.*
2) **Liu, Y. (2016)** NWA 10554, eucrite, *Meteorite Bulletin, 105.*
3) **Liu, Y. (2020)** NWA 13134, shergottite, *Meteorite Bulletin, 109.*
4) **Liu, Y. (2021)** NWA 13638, lunar breccia, *Meteorite Bulletin, 110.*

Teaching Experience

Lecturer, Spring of 2013-2015, *Caltech*
GS115c-Petrography of Igneous and Metamorphic Rock: a lab-based course for undergraduate students.

Instructor, Spring, 2006, 2010, 2011, *University of Tennessee*
GS460-Principles of Geochemistry: Developed syllabus and course materials for a senior-graduate level course with 9 students.
GS630-Phase Equilibria: Discussion-type graduate courses on silicate phase diagrams with 5-6 students.

Guest Lecturer, Winter, 2007, 2009, *University of Tennessee*,
GS103-Earth and Environment: 1.5-hour lecture on volcanic hazards to ~100 students.

Graduate Teaching Assistant, Winter, 2001, 2002, *University of Michigan*
GS 410-Earth Materials: Routine lectures on course topics; Design of the curriculum, experiments, and exams for the lab section.

Other Teaching-Associated Activities, *1998, 1999, 2000, University of Michigan,*
Participant in teaching workshops for international and graduate students. Lab assistant teaching users of a Cameca MBX electron microprobe and a Hitachi scanning electron microscope.

Mentoring Experience at JPL

Role	Period	Current Position
Postdoc Advisor		
Lee Saper	2023-present	N/A
David Burney	2021-2022	Lab Coordinator, Dept. Earth & Environmental Science The University of Pennsylvania
Jinping Hu	2015-2016	Staff Scientist, Caltech
Yang Chen	2013-2015	Consultant, Data Scientist
Graduate Thesis Committee/Co-mentor		
Scott Eckley, Univ. Texas Austin	2020-2022	JSC/Jacobs

Xue Su, Univ. Michigan	2020-2024	Caltech postdoc
Ziqi Yang, Univ. Michigan	2024-present	

Undergrad Thesis Advisor

Jen Caseres, Caltech	2014-2015	Geochemist, Lawrence Livermore National Laboratory

Undergrad Student Interns

Mengmeng (Stephanie) Zhang UCLA	2024	Grad School, WUSTL
Kevin Guan, UCSC	2022	Undergrad at UCSC
Richard Kim, USC	2015	Not sure
Barry Chew	2014	Not sure

Publications

Book Chapter

Williams, D.A., Byrne, P.K., Jozwiakd, L., **Liu, Y.**, Radebaugh, J., 2021. Effusive silicate volcanism: Observations and processes, in: Byrne, P.K., Lopes, R.M.C., Siegler, M.A. (Eds.), Planetary Volcanism across the Solar System. Elsevier.

Peer-Reviewed Articles (*Post-doc/student, Google scholar h-index = 49, i10-index = 92)

1. *Saper, L., **Liu, Y.** et al. 2025. Chemical, isotopic (O, He, U), and petrological characteristics of a slowly cooled enriched gabbroic shergottite, Northwest Africa 13134. *Meteoritics and Planetary Science* 60, DOI:10.1111/maps.14345.
2. Schmidt, M.E., Kizovski, T., **Liu, Y.,** et al. 2025. Diverse and highly differentiated lava suite in Jezero crater, Mars: Constraints on intracrustal magmatism revealed by Mars 2020 PIXL. ***Science Advances*** **11**, doi:10.1126/sciadv.adr2613
3. *Su, X., Zhang, Y., **Liu, Y.**, Holder, R.M. 2025b. Cooling history and evolution dynamics of green glass beads during lunar fire-fountain eruptions: Insights from Na, K and Cu distributions. *JGR-Planets* http://dx.doi.org/10.1029/2025JE009027.
4. *Su, X., Zhang, Y., **Liu, Y.** 2025a. Sulfur outgassing and in-gassing in lunar orange beads and implications for ^{33}S "anomaly" in the Moon. *Geochemica et Cosmochemica Acta* 397, 164-175.
5. Carrier, B., et al. (2025) Mars Sample Return (MSR) Sample Receiving Project (SRP) measurement definition team (MDT) final report. Astrobiology https://doi.org/10.1177/153110742513822.
6. Hurowitz, J. et al. (2025) Redox-drive mineral and organic associations in Jezero crater, Mars. ***Nature*** 645, 332-340.
7. Shumway, A.O. et al. 2025. Mineralogically diverse and salt-rich regolith in Jezero crater characterized using X-ray spectroscopy. *JGR-Planets*, https://doi.org/10.1029/2024JE008912.
8. Hernandez Montenegro, J. et al. 2025. Petrogenesis of the olivine cumulate outcrop Issole-the missing link between the Seitah and Maaz formations in Jezero crater, Mars. *Icarus* (accepted)
9. Tosca, N.J. et al. 2025. In situ evidence for serpentinization within the Maaz formation, Jezero crater, Mars. ***Science Advances*** DOI: 10.1126/sciadv.adr879.
10. Treiman, A et al. 2025 The Brac/Dourbes olivine-cumulate rock, Séítah Formation, Jezero Crater floor, Mars: Its parent magma, and relation to basalts of the Máaz Formation. *JGR-Planets*, e2024JE008539, https://doi.org/10.1029/2024JE008539.
11. Moreland, E., et al., 2025. Multiple episodes of fluid alteration in Jezero crater indicated by MIST mineral identifications in PIXL XRF data from the first 1100 sols of the Mars 2020 mission. *JGR-Planets* e2024JE008797. https://doi.org/10.1029/2024JE008797.

12. Kizovski, T.**,** et al. 2025. Fe-phosphates in Jezero Crater as Evidence for an Ancient Habitable Environment on Mars. ***Nature Communication*** *16, 6470.*
13. Martin, J. S., Leone, G. et al. 2025. Prospecting the first Chilean Martian simulants from the Atacama desert for ISRU and potential applications. *Icarus* **429**, doi: 10.1016/j.icarus.2024.116403
14. VanBommel, S., et al. 2025. Rare earth element assessment in Jezero crater using the planetary instrument for X-ray Lithochemistry on the Mars 2020 rover perseverance: A case study of cerium, *Icarus* **425**, doi: 10.1016/j.icarus.2024.116355
15. **Liu, Y.,** Ma, C., **2024**. Vapor condensates on the most pristine black beads from a clod in Apollo drive tube 73001: Discovery of lunar NaCl nanocrystals. *JGR – Planet*s, **129,** e2024JE008444. Doi: 10.1029/2024JE008444.
16. *Eckley, S.A., Ketcham, R.A., **Liu, Y.**, Gross, J., McCubbin, F., 2024. Emplacement of shergottites in the martian crust inferred from 3D petrofabric and crystal size distribution analyses. *Meteoritics and Planetary Science*, **59**, 1523-1545. doi: 10.1111/maps.14165.
17. *Eckley, S.A., Ketcham, R.A., **Liu, Y.**, Udry, A., Gross, J. 2024. New olivine morphologies in shergottites reveal complex thermal histories of martian magmas. *Geochemica et Cosmochemica Acta,* **373***,* 197-210.
18. Larson, P. et al. 2024. Adaptive sampling with PIXL on the Mars Perseverance rover. *Icarus*, **429**, doi:10.1016/j.icarus.2024.116433.
19. Mansbach, E.N., et al. 2024. Likely ferromagnetic minerals identified by the Perseverance rover and implications for future plaeomagnetic analyses of returned Martian samples. *JGR-Planets,* **129***, e*2024JE008505. Doi:10.1029/2024JE008505.
20. Scheller, E.L. et al. 2024. Inorganic interpretation of luminescent materials encountered by the Perseverance rover on Mars. ***Science Advances*** 10, doi: 10.1126/sciadv.adm8241.
21. Siljestrom, S., et al. 2024. Evidence of sulfate-rich fluid alteration in Jezero crater floor, Mars. *JGR-Planet, 129,* e2023JE007989.
22. Hu, J., Asimow, P.D., **Liu, Y.**, Ma, C., **2023**. Shock-recovered maskelynite indicates low-pressure ejection of shergottites from Mars. ***Science Advances****,* **9**, 10.1126/science.abo2196.
23. Su, X., Zhang, Y.X., **Liu, Y.**, Holder, R. 2023. Outgassing and in-gassing of Na and Cu in lunar 74220 orange glass beads. *Earth and Planetary Science Letters* ***602,*** 10.1016/j.epsl.2022.117924.
24. *Henneke, J., Pedersen, D.K.A., **Liu, Y.,** et al. 2023. A radiometric correction method and performance characteristics for PIXL's multispectral analysis using LEDs. *Space Science Reviews* **219**, doi:10.1007/s11214-023-01014-5.
25. Beyssac, O. et al. 2023. Petrological traverse of the olivine cumulate formation on the floor of Jezero Crater, Mars: a perspective from SuperCam onboard Perseverance. *JGR-Planets* 10.1029/2022JE007638.
26. Casademont, T.M. et al. 2023. RIMFAX ground penetrating radar reveals dielectric permittivity and rock density of shallow Martian subsurface. *JGR-Planet,* 10.1029/2022JE007598.
27. Horgan, B. et al. 2023. Mineralogy, morphology, and emplacement history of the Maaz formation on the Jezero crater floor from orbital and rover observations. *JGR-planet*, 10.1029/2022JE007612.
28. McCubbin, F.M., et al. 2023. Endogenous lunar volatiles. *Reviews in Mineralogy and Geochemistry*, 89 (1):729-786. (YL as one of the chapter leads)
29. Sharma, S. et al. 2023. Diverse organic-mineral associations in Jezero Crater, Mars. *Nature* **619,** 724-732. doi: 10.1038/s41586-023-06143-z.
30. Sun, V. et al. 2023. Exploring the Jezero crater floor: Overview and results from the Mars 2020 Perseverance Rover's first science campaign on the Jezero crater floor. *JGR-planet* 10.1029/2022JE007613.

31. Udry, A., et al. 2023. A Mars 2020 Perseverance SuperCam Perspective on the Igneous Nature of the Máaz formation at Jezero crater and link with Séítah, Mars. *JGR-planets*, 10.1029/2022JE007440.
32. **Liu, Y.** and Ma, C. **2022**. Direct evidence of volcanic outgassing of Na and K on the Moon from Apollo orange beads. *Icarus* **382***,* doi: 10.1016/j.icarus.2022.115044.
33. **Liu, Y.** et al. 2022. An olivine cumulate outcrop on the floor of Jezero crater, Mars. ***Science,* 377**, 1513-1519.
34. Farley, K. et al. 2022. Aqueously altered igneous rocks on the floor of Jezero crater, Mar. *Science* 377, eabo2196, 10.1126/science.abo2196.
35. Hollis, J.R., et al. 2022. The power of paired proximity science observations: Co-located data from SHERLOC and PIXL on Mars. *Icarus* **387**, 115179.
36. Phelan, N., et al. 2022. A ^{187}Re-^{187}Os, ^{87}Rb-^{87}Sr, highly siderophile and incompatible trace element study of some carbonaceous, ordinary and enstatite chondrite meteorites. *Geochemica Cosmochmica Acta*, 318, 19-54.
37. Scheller, E.L. et al. 2022. Aqueous alteration processes in Jezero crater, Mars-implications for organic geochemistry. ***Science*, 378**, 10.1126/science.abo5204.
38. Shkolyar, S., Jaret, S. J., Cohen, B. A., Johnson, J. R., Ollila, A., Beyssac, O., Wiens, R., **Liu, Y.,** Holm-Alwmark, S. 2021. Identifying shocked feldspar on Mars using Perseverance spectroscopic instruments: Implications for geochronology studies on returned samples. *Earth, Moon, and Planets* **126,** 4, https://doi.org/10.1007/s11038-022-09546-6.
39. Tice, M. et al. 2022. Alteration History of Séítah Formation Rocks Inferred by PIXL X-ray fluorescence, x-ray Diffraction, and Multispectral Imaging on Mar**s. *Science Advances* 8**, 10.1126/sciadv.abp9084.
40. **Liu, Y.**, Fischer, W.W., Ma, C., Beckett, J.R., Tschauner, O., Guan, Y., Lingappa, U.F., Webb, S.M., Prakapenka, V.B., Lanza, N.L., Agee, C.B. **2021**. Manganese oxides in Martian meteorites Northwest Africa (NWA) 7034 and 7533. *Icarus* **364**, https://doi.org/10.1016/j.icarus.2021.114471.
41. Masiero, R.J., Davidsson, B.J.R., **Liu, Y**., Moore, K., Tuite, M. 2021. Volatility of sodium in carbonaceous chondrites at temperatures consistent with low-perihelia asteroids. *Planetary Science Journal* **2**, 165-178.
42. Nicklas, R.W., Day, J.M.D., Vaci, Z., Udry, A., **Liu, Y.**, Tait, K.T. 2021. Uniform oxygen fugacity of shergottite mantle sources and an oxidized martian lithosphere. *Earth and Planetary Science Letters,* **564**, 1-10.
43. Allwood, A.C., Wade L.A., Foote, M.C., et al. **2020**. PIXL: Planetary Instrument for X-ray Lithochemistry. *Space Science Reviews* **216**, 314, DOI: 10.1007/s11214-020-00767-7.
44. Farley, K., Williford, K., Stack, K.M., et al. 2020. Mars 2020 Mission Overview. *Space Science Reviews* **216**, 142, DOI: 10.1007/s11214-020-00762-y.
45. Stack, K.M., Calef III, F., Williams, N.R., et al. 2020. Photogeologic map of the Perseverance rover field site in Jezero Crater constructed by the Mars 2020 science team. *Space Science Reviews* **216**, 127, DOI: 10.1007/s11214-020-00739-x.
46. McIntosh, E.C., Day, J.M.D., **Liu, Y.**, et al. 2020. Examining the compositions of impactors striking the Moon using Apollo impact melt coats and anorthositic regolith breccia meteorites. *Geochim. Cosmochim. Acta* **274**, 192-210.
47. Ma, C., **Liu, Y**. **2019**. Discovery of a zinc-rich mineral on the surface of lunar orange pyroclastic beads. *American Mineralogist* **104**, 447-452.
48. Carrier, B.L., Abbey, W.J., Beegle, L.W., Bhartia, R., **Liu, Y.** 2019. Attenuation of ultraviolet radiation in rocks & minerals: Implications for Mars science. *JGR-Planets*, **124**, 2599-2612.

49. Ma, C., Tschauner, O., Beckett, J. R., **Liu, Y**. 2019. Chenmingite, $FeCr_2O_4$ in the $CaFe_2O_4$-type structure, a shock-induced, high-pressure mineral in the Tissint martian meteorite. *American Mineralogist* **104**, 1521-1525.
50. **Liu, Y.**, Chen Y., Guan Y., Eiler, J.M., Ma C., Rossman, G.R., Zhang, Y. **2018**. Impact-melt hygrometer for Mars: The case of shergottite Elephant Moraine (EETA) 79001. *Earth & Planetary Science Letters*, **490**, 206-215.
51. Day, J.M.D., Tait, K.T., Udry, A., Moynier, F., **Liu, Y.**, and Neal, C.R. 2018. Martian magmatism from plume metasomatized mantle. *Nature Communications***, 9**, 4799.
52. Myers, M.L., Wallace, P.J., Wilson, C.J.N., Watkins, J.L., **Liu, Y**. 2018. Ascent rates of rhyolitic magma at the onset of three caldera-forming eruptions. *American Mineralogist*, **103**, 952-965.
53. Hui, H., Guan, Y., Chen, Y., Peslier, A. H. Zhang, Y., **Liu, Y.**, Flemming, R. L., Rossman, G. R., Eiler, J. M., Neal, C. R., Osinski, G. R. **2017**. A heterogeneous lunar interior for hydrogen isotopes as revealed by lunar highlands samples. *Earth & Planetary Science Letters,* **473**, 14-23.
54. Kuchka, CR, Herd, C., Walton, E. L., Guan, Y., **Liu, Y.** 2017. Martian low-temperature alteration materials in shock-melt pockets in Tissint: Constraints on their preservation in shergottite meteorites. *Geochimica et Cosmochimica Acta*, **210**, 228-246.
55. **Liu, Y.,** Ma, C., Beckett, J., Chen, Y., Guan, Y. **2016a**. Rare-earth-element minerals in martian breccia meteorite NWA 7034 and 7533: Implications for fluid-rock interaction in the martian crust. *Earth & Planetary Science Letters,* **451**, 251-262.
56. **Liu, Y**., Baziotis, I.P., Asimow, P.D., Bodnar, R.J., Taylor, L.A., 2016b. Mineral chemistry of the Tissint meteorite: Indications of two-stage crystallization in a closed system. *Meteoritics & Planetary Science,* **51**, 2293-2315.
57. Howarth, G.H., **Liu, Y.,** Chen, Y., Pernet-Fisher, J.F., and Taylor, L.A. 2016. Postcrystallization metasomatism in shergottites: Evidence from the paired meteorites LAR 06319 and LAR 12011. *Meteoritics & Planetary Science,* **51***,* 2061-2072.
58. Ma, C., Tschauner, O., Beckett, J. R., **Liu, Y.**, Rossman, G. R., Stanislav, V., Sinogeikin, S., Smith, J., Taylor, L. A. 2016. Ahrensite, γ- Fe_2SiO_4, a new shock-metamorphic mineral from the Tissinte meteorite-implications for the Tissint shock event on Mars. *Geochimica et Cosmochimica Acta*, **184**, 240-256.
59. Taylor, L.A., **Liu, Y.**, Lofgren, G. 2016. Integrity of lunar soil samples. ***Nature Geoscience,*** **9**, 87-87.
60. Taylor L. A., Logvinova, A., Howarth, G.H., **Liu**, **Y**., Peslier, A., Guan, Y., Chen, Y., Sobolev, N.V. 2016. Low water contents in diamond mineral inclusions: Proto-genetic origin in a dry cratonic lithosphere. *Earth & Planetary Science Letters,* **433**, 125-132.
61. *Chen, Y., **Liu, Y.,** Guan, Y., Eiler, J., Ma, C., Rossman, G. R., Taylor, L. A. **2015a**. Evidence in Tissint for recent subsurface water on Mars. *Earth & Planetary Science Letters,* 425, 55-63.
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