Jinping Hu

Affiliation and Contact Information

Department of Earth and Atmospheric Sciences, University of Houston
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Professional Experiences

Assistant Professor, Department of Earth and Atmospheric Sciences, University of Houston 2025 Sep

Staff Scientist, Shock-wave laboratory, California Institute of Technology 2019-2025

Postdoctoral scholar, Division of Planetary and Geological Sciences, California Institute of Technology 2016-2019

Graduate teaching assistant, Arizona State University 2014-2016

Graduate research associate, Arizona State University 2010-2014

Undergraduate assistant (TIMS laboratory), Nanjing University 2008-2010

Education

Ph.D., Geological Sciences, Arizona State University, Tempe AZ, USA 2016

Dissertation: Shock metamorphism in ordinary chondrites: constraining pressure and temperature history

Advisor: Dr. Thomas Sharp

B.Sc., Geochemistry, Nanjing University, Nanjing, Jiangsu, China 2010

Thesis: Geochronology and geochemistry of the molybdenite deposit and host granite, in Gexianshan, Jiangxi Province, South China

Advisor: Dr. Shao-yong Jiang

Research Interests and Expertise

Shock metamorphism in planetary and terrestrial impacted rocks

Shock-wave dynamic high-pressure experiments

Electron microscopy nano-analysis of natural and synthetic materials

Research Grants

NASA Solar System Workings - Rethinking the shock metamorphism pressure scale in light of new experimental and analytical capabilities – 2018-2020 $292,094
Role: Science lead (proposal writing and supervision; PI: Paul Asimow, Caltech)

NASA Solar System Workings - Reconstructing the melt composition and volatile record of Chassignite NWA 2737 – 2021-2025 CIT-subcontract $143,000
Role: Co-Investigator (PI: Esteban Gazel, Cornell University)

Caltech Center for Center for Comparative Planetary Evolution - An experimental study for volatiles ingassing and D/H fractionation during impact processes in Martian rock analogue – 2022 $8,400
Role: Investigator

NASA Solar System Workings - Lithification of Martian regolith breccia: how and when did it happen? – Selected 2025-2028 $864,128
Role: Science-PI (PI: Paul Asimow, Caltech)

Teaching and Mentoring Experience

GLG 321 Mineralogy (graduate instructor), Arizona State University 2014-2016

Mentor for ASU/NASA Space Grant undergrad fellows 2010-2016
Students mentored: Sarah Deitrick (JSC/Jacobs lunar scientist), Balie Walker (geologist at Department of Natural Resources, Canada)

Mentor for Caltech SURF/WAVE undergrad fellows 2021-2023
Students mentored: Jina Lee (graduate student at Princeton University), Jenna Meyers (Senior in Chemistry at Wellesley College, intern at GSFC)

Academic Services

Reviewer for:

NSF (EAR Petrology & Geochemistry)
Nature Astronomy, Nature Communications, GCA, GRL, JGR Planets, American Mineralogist, Physics and Chemistry of Minerals, Meteoritics & Planetary Science, Progress in Earth and Planetary Science, Planetary and Space Science

Dwornik Award judge for Lunar and Planetary Science Conference 2014-2019

New Mineral Named

Jonlarsenite, IMA No. 2024-078a, formula: Al_4Cu_9, space group: No. 215 *P*-43/*m*

Honors and Awards

Outstanding graduate teaching assistant award, School of Earth and Space Exploration, Arizona State University, 2016

Stephen E. Dwornik Planetary Geoscience Student Paper Award (Honorable Mention Graduate Poster), Lunar and Planetary Science Conference XLV, 2014

Graduate Excellence Award, College of Liberal Arts and Sciences, Arizona State University, 2014

Wiley-Blackwell Award for Outstanding Student Presentation, 76th Meteoritical Society Annual Meeting, 2013

Brian Mason Travel Award, 76th Meteoritical Society Annual Meeting, 2013

Peer-reviewed Publications (*corresponding author)

1) Baziotis I., Ferrière L., Ma C., **Hu J.**, Palles D., Asimow P.D. New knowledge of shock events affecting the L-chondrite parent body from two heavily shocked L6 meteorites finds. *Meteoritics and Planetary Sciences (submitted)*
2) Bardziński P.J., Kulesza D., Asimow P.D., **Hu J.** et al. Improvement of magnetic properties of single grain flux-grown icosahedral AlCuFe quasicrystal by shock compression. *Physical Review Materials* (*submitted*)
3) Bardziński P.J., Kulesza D., Asimow P.D., **Hu J.**, Armstrong S., Silevitch D.M., Rosenbaum T. Structure and magnetic properties of Eu- and Nd-doped flux-grown icosahedral Al-Cu-Fe quasicrystals. *Acta Materialia* (*submitted*)
4) Melwani Daswani M., Greber N. D., **Hu J.**, Greenwood, R. C., & Heck, P. R. Geochemistry and petrography of martian meteorite Northwest Africa 11115: A rare earth element-enriched olivine-phyric shergottite closely linked to Northwest Africa 1068. *Meteoritics and Planetary Sciences* (*in revision*)
5) Bindi L., Larsen J., Kihle J. B., Cheng G., **Hu J.** et al. Jonlarsenite, Al_4Cu_9, a new intermetallic phase in the Al–Cu system discovered in a micrometeorite from Oslo, Norway. *European Journal of Mineralogy* (*accepted*)
6) Bindi L., Larsen J., Kihle J. B., Cheng G., **Hu J.** et al. Metallic messengers from the cosmos: Rare AlCu-bearing meteorites from the Project Stardust collection. *Meteoritics and Planetary Sciences* 60: 1609-1620
7) Simopoulou M., Baziotis I., Ferrière L., **Hu J.** et al. 2025. Raman Study of the Slobodka Ordinary Chondrite. *Journal of Raman Spectroscopy* 0:1-16
8) Bardziński P., Weselski M., Asimow P., **Hu J.**, Fu R. 2025. Magnetic response and hardness enhancement by spontaneous directional coarsening of Fe_2AlB_2 in quasicrystal-rich matrix. *Journal of Alloys and Compounds* 1010: 177791
9) **Hu J.***, Asimow P. D., Ma, C., Steinhardt, P. J., Bindi L. 2024. Quasicrystal synthesis by shock compression. *Communications Chemistry* (in Nature Portfolio) 7: 232

10) Ma C., **Hu J.**, Suttle M. D., Guan Y., Sharp T. G., Asimow P. D., Steinhardt P. J., and Bindi L. 2023. Al-Cu-Fe alloys in the solar system: Going inside a Khatyrka-like micrometeorite (KT01) from the Nubian desert, Sudan. *Meteoritics & Planetary Science* 58: 1642-1653.

11) **Hu J.***, Asimow P. D., Liu Y., and Ma C. 2023. Shock-recovered maskelynite indicates low-pressure ejection of shergottites from Mars. *Science Advances* 9: eadf2906.

12) Baziotis I. P., Xydous S., Papoutsa A., **Hu J.**, Ma C., Ferrière L., Klemme S., Berndt J., and Asimow P. D. 2023. Investigation of the shocked Viñales ordinary chondrite (L6) meteorite fall – Implications for shock classification, fragmentation, and collision dynamics. *Icarus* 390: 115326.

13) Bindi L., Pasek M. A., Ma C., **Hu J.**, Cheng G., Yao N., Asimow P. D., and Steinhardt P. J. 2023. Electrical discharge triggers quasicrystal formation in an eolian dune. *Proceedings of the National Academy of Sciences* 120: e2215484119.

14) **Hu, J.***, and Sharp, T.G., 2022. Formation, preservation and extinction of high-pressure minerals in meteorites: temperature effects in shock metamorphism and shock classification. *Progress in Earth and Planetary Science* 9: 6.

15) Baziotis I., Xydous S., Papoutsa A., **Hu J.**, Ma C., Klemme S., Berndt J., Ferrière L., Caracas R., and Asimow P. D. 2022. Jadeite and related species in shocked meteorites: Limitations on inference of shock conditions. *American Mineralogist* 107: 1868–1877.

16) Baziotis, I.P., Ma, C., Guan, Y., Ferrière, L., Xydous, S., **Hu, J.**, Kipp, M.A., Tissot, F.L.H. and Asimow, P.D., 2022. Unique evidence of fluid alteration in the Kakowa (L6) ordinary chondrite. *Scientific Reports* 12(1): 1-15.

17) **Hu, J.***, Asimow, P.D., and Ma, C., 2020. Shock synthesis of Al-Fe-Cr-Cu-Ni icosahedral quasicrystal. AIP Conference Proceedings 2272: 100013.

18) **Hu, J.***, Asimow, P.D., Ma, C., and Bindi, L., 2020. First synthesis of a unique icosahedral phase from the Khatyrka meteorite by shock-recovery experiment. *IUCrJ* 7: 434–444.

19) Sharp, T.G., Walton, E.L., **Hu, J.** and Agee, C., 2019. Shock conditions recorded in NWA 8159 martian augite basalt with implications for the impact cratering history on Mars. *Geochimica et Cosmochimica Acta* 246: 197-212.

20) Baziotis, I., Asimow, P.D., **Hu, J.**, Ferrière, L., Ma, C., Cernok, A., Anand, M. and Topa, D., 2018. High pressure minerals in the Château-Renard (L6) ordinary chondrite: implications for collisions on its parent body. *Scientific reports* 8(1): 9851

21) Walton E. L., Sharp T. G., **Hu J.**, and Tschauner O. 2018. Investigating the response of biotite to impact metamorphism: Examples from the Steen River Impact Structure, Canada. *Meteoritics and Planetary Science* 53: 75-92

22) Oppenheim J., Ma C., **Hu J.**, Bindi L., Steinhardt P. J., and Asimow P. D. 2017. Shock synthesis of decagonal quasicrystals. *Scientific Reports* 7: 15628

23) Oppenheim J., Ma C., **Hu J.**, Bindi L., Steinhardt P. J., and Asimow P. D. 2017. Shock synthesis of five-component icosahedral quasicrystals. *Scientific Reports* 7: 15629

24) **Hu J.*** and Sharp T. G. 2017. Back transformation of high-pressure minerals in the Mbale L chondrite: Low-pressure minerals reveal a high shock pressure. *Geochimica et Cosmochimica Acta* 215: 277-294

25) Weiss B. P., Wang H., Sharp T. G., Gattacceca J., Shuster D. L., Downey B., **Hu J.**, Fu R. R., Kuan A. T., Suavet C., Irving A. J., Wang J., and Wang J. 2017. A nonmagnetic differentiated early planetary body. *Earth and Planetary Science Letters* 468: 119–132.

26) **Hu J.*** and Sharp T. G. 2016. High-pressure phases in shock-induced melt of the unique highly shocked LL6 chondrite Northwest Africa 757. *Meteoritics and Planetary Science* 51: 1353-1369

27) Walton E. L., Sharp T. G. and **Hu J.** 2016. Frictional melting processes and the generation of shock veins in terrestrial impact structures: evidence from the Steen River impact structure, Alberta, Canada. *Geochimica et Cosmochimica Acta* 180: 256-270.

28) Sharp T. G., Xie Z., DeCari P. S. and **Hu J.** 2015. A large shock vein in L chondrite Roosevelt County 106: Evidence for a long-duration shock pulse on the L chondrite parent body. *Meteoritics and Planetary Science* 50: 1941-1953.

29) Walton E. L., Sharp T. G., **Hu J.** and Filiberto J. 2014. Heterogeneous mineral assemblages in martian meteorite Tissint as a result of a recent small impact event on Mars. *Geochimica et Cosmochimica Acta* 140: 334–348.

30) **Hu J.** and Jiang S. 2010. Zircon U-Pb dating and Hf isotopic compositions of porphyrites from the Ningwu basin and their geological implications. *Geological Journal of China Universities* 16: 294-308. (*in Chinese with English translation*)

Selected Conference Presentations:

1) Huggins E.G., Gazel E., Hu J., Asimow P.D. 2025. Survival of Melt Inclusions in Experimentally Shocked Samples: Implications for MIs found in Martian Meteorites. *LPSC* 2025 #1740

2) Meyers J., Hu J. and Asimow P.D. 2023. Deformation and Misorientation Barometer for Experimentally Shocked Olivine: A Micro- to Meso-Scale EBSD Study. *AGU Fall Meeting* P13B-2796 (Student mentored)

3) Asimow P.D., and Hu J. 2022. Soda-lime Glass Revisited: Applying an Energy-Dependent Grüneisen Model to Shock Velocity, Temperature, and Sound Speed Data. *22nd Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter* P04.00004.

4) (Invited) Hu J., and Asimow P. D. 2020. Reproducing the high-pressure metallic, oxide and silicate minerals found in meteorites using novel shock-recovery experiments. *JpGU-AGU joint meeting* C004644.

5) Hu J., and Asimow P. D. 2020. A Shock Barometer by Quantitative Olivine Deformation and Misorientation Measurement from Shock-Recovery Experiments. *51st Lunar and Planetary Science Conference* #3042.
6) (Invited) Hu J., Asimow P.D., Ma C., Bindi L. 2019. New compositions of shock-synthesized AlCuFe icosahedral quasicrystals: implications for the impact origin of natural quasicrystals in the Khatyrka meteorite. *15th Italian National Congress of Planetary Science* 137.
7) Asimow P. D., Pardo O. S., and Hu J. 2018. Sound Speed and Temperature in Shock-compressed Silicate Liquids: Direct Constraints on Grüneisen Parameters and Heat Capacities. *AGU Fall Meeting* MR31A-06.
8) Hu J., Liu Y., Asimow P. D., Ma C., Beckett J. R., and Agee C. B. 2018. Unique Hydrothermal Alteration on Mars: Pyrite-Polycrystalline Pyrrhotite Assemblage in Northwest Africa 7034/7533. *49th Lunar and Planetary Science Conference* #2898.
9) Pan L., Ehlmann B. L., Asimow P. D., Hu J., and Greenberger R. N. 2018. An Infrared Spectroscopy Study of Impact Shocked Carbonates and Implications for Mars. *49th Lunar and Planetary Science Conference* #1896.
10) Fudge C., Hu J., Ma C., Wittmann A., and Sharp T. G. 2017. Shock Induced Feldspar and Silica Transformation in Polymict Eucrite Northwest Africa 10658. *48th Lunar and Planetary Science Conference* #1896 #2525.
11) Hu J., and Sharp T. G. 2016. Shocked Feldspar in Martian Meteorites: Evidence Against Pervasive Melting and Resetting. *47th Lunar and Planetary Science Conference* #2542.
12) Hu J., and Sharp T. G. 2015. Collisional Histories of Ordinary Chondrite Parent Bodies: Information from Shock Induced High-Pressure Minerals. *46th Lunar and Planetary Science Conference* #2601.
13) Hu J., Sharp T. G., and Walton E. L. 2013. Shock Effects in Tissint II: Olivine Transformation to Silicate Perovskite and Oxide. *44th Lunar and Planetary Science Conference* #1041.