Yifei Jiao

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About Me

Hello! I am Yifei Jiao (he/him), a postdoc researcher at University of California Santa Cruz and Tsinghua University. My research interests are focused on **the collisional and dynamical evolution of small bodies and moons**, as well as the deep space exploration dynamics. I would enjoy exploring any unsolved and exciting questions of our solar system with theoretical and numerical methods.

Education

Tsinghua University, Beijing, China Sep 2020–Jun 2025
PhD with Prof. Hexi Baoyin
Numerical modeling of impact dynamics and collisional evolution of asteroids

Tsinghua University, Beijing, China Sep 2016–Jun 2020
Bachelor
Monte Carlo tree search for optimizing multi-target deep space exploration

Experience

University of California Santa Cruz, CA, USA Sep 2025–now
Postdoctral Research Fellow with Prof. Francis Nimmo

Shanghai Astronomical Observatory, Shanghai, China Aug 2025
Visiting Scholar with Prof. Xian Shi

University of Tokyo & NAOJ, Tokyo, Japan May 2025
Visiting Scholar with Prof. Seiji Sugita

LPL, University of Arizona, Tucson, AZ, USA Jan–Jun 2024
Visiting Student with Prof. Erik Asphaug

Tsinghua University, Beijing, China 2020, 2021
Teaching Assistant for Theoretical Mechanics

Grants

National Natural Science Foundation of China ($42.8k) 2024–2025
Impact dynamics and collisional evolution of highly porous asteroids

Youth Talent Support Program of China Association for Science and Technology ($5.7k) 2024–2025
Host by Chinese Society of Space Research

Honors and Awards

Excellent Doctoral Dissertation Award, Chinese Society of Astronautics 2025

Excellent Doctoral Dissertation Award, Tsinghua University 2025

Excellent Doctoral Graduate Award, Beijing Municipality 2025

Tsinghua Top Grade Scholarship (Highest Honor for Students, 10 per year) 2024

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China National Scholarship	2024
Excellent Paper Award, Young Scientist Forum of Planetary Science, China	2023
Tsinghua Short-term Study Abroad Scholarship	2023
The First/Second Prize Scholarship, Tsinghua University	2022, 2023
China Trajectory Optimization Competition, 2nd Place, China	2020
Air Cargo Challenge, 4th Place, Germany	2019
Excellent Technology & Innovation Scholarship, Tsinghua University	2019
Excellent Academic Scholarship, Tsinghua University	2017, 2018, 2019

First/Corr*-Author Publications

1. **Y. Jiao**, B. Cheng, W. Dai, E. Asphaug, M. Jutzi, S. Raducan, X. Yan, Y. Yu, H. Baoyin. *Giant craters on asteroid 253 Mathilde revealing the cohesive porous interior of carbonaceous parent bodies. Nature Geoscience (under review)*
2. **Y. Jiao**, B. Cheng, H. Baoyin. *Probing the Moon from future asteroid impacts: a review. Science China Technological Sciences (accepted)*
3. **Y. Jiao**, B. Cheng, Y. Huang, E. Asphaug, B. Gladman, R. Malhotra, P. Michel, Y. Yu, H. Baoyin. *Asteroid 469219 Kamoʻoalewa's journey from the lunar Giordano Bruno crater to Earth 1:1 resonance. Nature Astronomy (2024)*
4. **Y. Jiao**, X. Yan, B. Cheng, H. Baoyin. *SPH-DEM modeling of hypervelocity impacts on rubble-pile asteroids. Monthly Notices of the Royal Astronomical Society (2023)*
5. **Y. Jiao**, B. Cheng, H. Baoyin. *Optimal kinetic-impact geometry for asteroid deflection exploiting Delta-V hodograph. Journal of Guidance, Control, and Dynamics (2022)*
6. Y. He, Y. Wu, **Y. Jiao***, W. Dai, B. Cheng, H. Baoyin. *Observation timelines for the potential lunar impact of asteroid 2024 YR4. The Astrophysical Journal Letters (under review)*
7. Y. Wu, **Y. Jiao***, W. Dai, Y. Huang, Z. Liu, B. Cheng, H. Baoyin, J. Li. *Detectability of lunar-origin asteroids in the LSST era. The Astrophysical Journal (2026)*
8. T. Baoyin, **Y. Jiao***, B. Cheng. *Predicting the collision history of basaltic asteroids from parametrized shapes with an artificial neural network. Monthly Notices of the Royal Astronomical Society (2025)*

Co-Author Publications

1. W. Dai, B. Cheng, Y. Huang, **Y. Jiao**, W. Zhou, K. Ren, H. Agrusa, S. Jacobson, E. Kokubo, S. Charnoz, Y. Yu, H. Baoyin, J. Li. *Diverse configurations of binary asteroids explained by multi-generation satellites. Nature Communications (under review)*
2. X. Yan, P. Michel, R. Ni, **Y. Jiao**, J. Li. *The Material Point Method (MPM) for simulating hypervelocity impact on asteroids. Icarus (under review)*
3. N. Zhang, Z. Zhang, **Y. Jiao**, H. Baoyin. *Multi-trajectory combination for multiple ground target observation by maneuvering on-orbit satellites. IEEE Transactions on Aerospace and Electronic Systems (2023)*
4. Z. Zhang, N. Zhang, **Y. Jiao**, H. Baoyin, J. Li. *Multitree search for multisatellite responsiveness scheduling considering orbital maneuvering. IEEE Transactions on Aerospace and Electronic Systems (2021)*

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Conferences/Seminars

Lunar and Planetary Science Conference, The Woodlands, TX, USA	Mar 2026
Seminar, Shanghai Astronomical Observatory, Shanghai, China	Aug 2025
PhD Academic Forum of Tsinghua University, Beijing, China	May 2025
Seminar, National Astronomical Observatory of Japan, Tokyo, Japan	May 2025
Seminar, University of Tokyo, Tokyo, Japan	May 2025
Europlanet Science Congress, Berlin, Germany	Sep 2024
Young Scientist Forum of Planetary Science, Sanya, China	Mar 2023

Software

1. **Y. Jiao**, et al. The SPHSOL code, which is a parallel smooth particle hydrodynamics C++ solver for simulating high-velocity impact and tidal response of planetary bodies. https://sphsol-tutorial.readthedocs.io

Student Mentoring

Yixuan Wu, Yifan He (Tsinghua University)	2025
Tamier Baoyin (Dartmouth College)	2024

Services

Referee for Nature Communications, Space: Science & Technology, Earth and Planetary Physics

Co-organizer of UCSC Earth & Planetary Science IGPP Seminar Winter 2026