

Yifei Jiao

<https://yifei-jiao.github.io>

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ABOUT ME

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

EDUCATION

Tsinghua University, Beijing, China <i>PhD with Prof. Hexi Baoyin</i> <i>Numerical modeling of impact dynamics and collisional evolution of asteroids</i>	Sep 2020–Jun 2025
Tsinghua University, Beijing, China <i>Bachelor</i> <i>Monte Carlo tree search for optimizing multi-target deep space exploration</i>	Sep 2016–Jun 2020

EXPERIENCE

University of California Santa Cruz, CA, USA <i>Postdoc with Prof. Francis Nimmo</i>	Sep 2025–now
Shanghai Astronomical Observatory, Shanghai, China <i>Visiting Scholar with Prof. Xian Shi</i>	Aug 2025
University of Tokyo & NAOJ, Tokyo, Japan <i>Visiting Scholar with Prof. Seiji Sugita</i>	May 2025
LPL, University of Arizona, Tucson, AZ, USA <i>Visiting Student with Prof. Erik Asphaug</i>	Jan–Jun 2024
Tsinghua University, Beijing, China <i>Teaching Assistant for Theoretical Mechanics</i>	2020, 2021

GRANTS

National Natural Science Foundation of China (\$42.8k) <i>Impact dynamics and collisional evolution of highly porous asteroids</i>	2024–2025
Youth Talent Support Program of China Association for Science and Technology (\$5.7k) <i>Host by Chinese Society of Space Research</i>	2024–2025

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

Last updated: April 2026

China National Scholarship	2024
Excellent Paper Award, Young Scientist Forum of Planetary Science, China	2023
Short-term Study Abroad Scholarship, Tsinghua University	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

PUBLICATIONS

As First/Corresponding* Author:

1. **Y. Jiao***, F. Nimmo, J. Wisdom, R. Dbouk. Investigating tidal stripping of a pre-existing moon as the origin of Saturn's young icy rings. *Astrophys. J. Lett.* (under review)
2. **Y. Jiao**, B. Cheng, W. Dai, E. Asphaug, et al. Giant craters on asteroid 253 Mathilde revealing the cohesive porous interior of carbonaceous parent bodies. *Nature Geoscience* (under review)
3. **Y. Jiao**, B. Cheng, H. Baoyin. Probing the Moon from future asteroid impacts: a review. *Sci. China Technol. Sci.* (2026)
4. 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. *Astrophys. J.* (2026)
5. Y. He, Y. Wu, **Y. Jiao***, W. Dai, X. Liu, B. Cheng, H. Baoyin. Observation timelines for the potential lunar impact of asteroid 2024 YR4. *Astrophys. J.* (2026)
6. T. Baoyin, **Y. Jiao***, B. Cheng. Predicting the collision history of basaltic asteroids from parametrized shapes with an artificial neural network. *Mon. Not. R. Astron. Soc.* (2025)
7. **Y. Jiao**, B. Cheng, Y. Huang, E. Asphaug, et al. Asteroid Kamo'oaewa's journey from the lunar Giordano Bruno crater to Earth 1:1 resonance. *Nature Astronomy* (2024)
8. **Y. Jiao**, X. Yan, B. Cheng, H. Baoyin. SPH-DEM modeling of hypervelocity impacts on rubble-pile asteroids. *Mon. Not. R. Astron. Soc.* (2023)
9. **Y. Jiao**, B. Cheng, H. Baoyin. Optimal kinetic-impact geometry for asteroid deflection exploiting Delta-V hodograph. *J. Guid. Control Dyn.* (2022)

As Contributing Author:

10. W. Dai, B. Cheng, Y. Huang, **Y. Jiao**, et al. Diverse configurations of binary asteroids explained by multi-generation satellites. *Nature Communications* (accepted)
11. X. Yan, P. Michel, R. Ni, **Y. Jiao**, J. Li. The Material Point Method (MPM) for simulating hypervelocity impact on asteroids. *Icarus* (accepted)
12. Y. Wu, Y. Li, B. Zheng, ..., **Y. Jiao**, et al. The START mission: probing the 2029 Apophis flyby via a low-cost geocentric smallsat. *Planet. Sci. J.* (under review)
13. N. Zhang, Z. Zhang, **Y. Jiao**, H. Baoyin. Multi-trajectory combination for multiple ground target observation by maneuvering on-orbit satellites. *IEEE Trans. Aerosp. Electron. Syst.* (2023)
14. Z. Zhang, N. Zhang, **Y. Jiao**, H. Baoyin, J. Li. Multitree search for multisatellite responsiveness scheduling considering orbital maneuvering. *IEEE Trans. Aerosp. Electron. Syst.* (2021)

Last updated: April 2026

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 hypervelocity 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 2026