Yifei Jiao

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About Me

I am currently a PhD student at Laboratory of AstroDynamics, Tsinghua University. My research interests are focused on **asteroid exploration and deflection dynamics**, as well as the **collisional and dynamical evolution of small planetary bodies** in the solar system. I am also engaged in the exploration of numerical simulations and optimization algorithms in planetary science.

Education

Lunar & Planetary Laboratory, University of Arizona, Tucson, AZ, USA 2024
Visiting Student with Prof. Erik Asphaug

Tsinghua University, Beijing, China 2020–2025
PhD Student with Prof. Hexi Baoyin

Tsinghua University, Beijing, China 2016–2020
Bachelor

Grants

National Natural Science Foundation of China (PhD Student) 2024–2025
Impact dynamics and collisional evolution of highly porous asteroids

Experience

Teaching Assistant for Theoretical Mechanics, Tsinghua University 2020, 2021

Scholarships and Awards

The First/Second Prize Scholarship, Tsinghua University 2022, 2023

Excellent Academic Scholarship, Tsinghua University 2017, 2018, 2019

Excellent Paper Award, Young Scientist Forum of Planetary Science, China 2023

2nd Place, China Trajectory Optimization Competition, China 2020

4th Place, Air Cargo Challenge, Germany 2019

Publications

1. **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)*
2. **Y. Jiao**, E. Asphaug, B. Cheng, H. Baoyin. *Effect of giant cratering impacts on the slow rotation of asteroid Mathilde. Europlanet Science Congress (2024)*
3. **Y. Jiao**, et al. *Dynamical constraints linking Earth co-Orbital asteroid Kamoʻoalewa to the lunar Giordano Bruno impact. Lunar and Planetary Science Conference (2024)*

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4. **Y. Jiao**, et al. *Exploring asteroid (469219) Kamo'oalewa's possible origin from lunar crater Giordano Bruno. Asteroids, Comets, Meteors Conference (2023)*

5. **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)*

6. **Y. Jiao**, B. Cheng, H. Baoyin. *Optimal kinetic-impact geometry for asteroid deflection exploiting Delta-V hodograph. Journal of Guidance, Control, and Dynamics (2022)*

7. **Y. Jiao**, B. Cheng, S. Chen, H. Baoyin. *Numerical simulations of hypervelocity impacts to defend against small bodies. SCIENTIA SINICA Technologica (in Chinese, 2022)*

8. X. Yan, P. Michel, Y. Liu, R. Ni, **Y. Jiao**, J. Li. *Material Point Method (MPM) in simulating hypervelocity impact on asteroids. Icarus (submitted, 2024)*

9. 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)*

10. 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)*

Software

1. **SPHSOL**, which is a parallel smoothed particle hydrodynamics C++ solver for simulating the impact process in planetary science. https://sphsol-tutorial.readthedocs.io