

Publications and Computational Outputs

Yicheng Rui

My name is in bold; [†] denotes corresponding authorship.

Refereed publications

- Yicheng Rui**[†], Xiao-Wei Duan, Licai Deng, Fan Yang, Zhengming Dang, Zhengjun Du, Junhao Peng, Wenhao Chu, Umut Mahmut, Kexin Li, et al. (2026). “LenghuSky-8: An 8-Year All-Sky Cloud Dataset with Star-Aware Masks and Alt-Az Calibration for Segmentation and Nowcasting”. In: *CVPR 2026 Findings*. DOI: [10.48550/arXiv.2603.16429](https://doi.org/10.48550/arXiv.2603.16429). arXiv: [2603.16429](https://arxiv.org/abs/2603.16429).
- Li, Kexin, **Yicheng Rui**[†], Fabo Feng, Shuyue Zheng, Anton Pomazan, Yiyang Guo, Jie Zheng, and Lin-Qiao Jiang (2026). “AstroSkyFlow: An Astronomical Sky Image Flow Simulator for Time Domain Survey Validation and Machine Learning”. In: *The Astronomical Journal* 172.1, p. 56. DOI: [10.3847/1538-3881/ae75e2](https://doi.org/10.3847/1538-3881/ae75e2). URL: <https://doi.org/10.3847/1538-3881/ae75e2>.
- Du, Zhengjun, Qingquan Li, **Yicheng Rui**[†], Yu-Li Liu, Yu-Ting Wu, Dong Li, Bing-Feng Seng, Yi-Fan Xuan, and Fa-Bo Feng (2025). “DeepAP: Deep Learning-based Aperture Photometry Feasibility Assessment and Aperture Size Prediction”. In: *Research in Astronomy and Astrophysics* 25.10, p. 104003. DOI: [10.1088/1674-4527/adf716](https://doi.org/10.1088/1674-4527/adf716). URL: <https://doi.org/10.1088/1674-4527/adf716>.
- Yicheng Rui**[†], Yifan Xuan, Shuyue Zheng, Kexin Li, Kaiming Cui, Kai Xiao, Jie Zheng, Jun Kai Ng, Hongxuan Jiang, Fabo Feng, et al. (2025). “Architecture of the Tianyu Software: Relative Photometry as a Case Study”. In: *Publications of the Astronomical Society of the Pacific* 137.6, p. 064501. DOI: [10.1088/1538-3873/add6d9](https://doi.org/10.1088/1538-3873/add6d9). arXiv: [2505.09107](https://arxiv.org/abs/2505.09107).
- Feng, Fabo, **Yicheng Rui**[†], Zhimao Du, Q. Lin, C. C. Zhang, D. Zhou, K. M. Cui, M. Ogihara, M. Yang, J. Lin, et al. (2024). “Tianyu-Search for the Second Solar System and Explore the Dynamic Universe”. In: *Acta Astronomica Sinica* 65.4, p. 34. DOI: [10.15940/j.cnki.0001-5245.2024.04.001](https://doi.org/10.15940/j.cnki.0001-5245.2024.04.001). arXiv: [2404.07149](https://arxiv.org/abs/2404.07149).
- Yicheng Rui** and Fabo Feng (2024). “Mitigating astrometric bias in barycentric correction with PEXO”. In: *Monthly Notices of the Royal Astronomical Society* 527.4, pp. 11288–11303. DOI: [10.1093/mnras/stad3796](https://doi.org/10.1093/mnras/stad3796). arXiv: [2312.05480](https://arxiv.org/abs/2312.05480).
- Cui, Kaiming, Guang-Yao Xiao, Fabo Feng, Beibei Liu, Sergei Nayakshin, Cassandra Hall, Kangrou Guo, Dong Lai, Masahiro Ogihara, **Yicheng Rui**, et al. (2026). “A universal brown dwarf desert formed between planets and stars”. In: *Proceedings of the National Academy of Sciences* 123.9, e2524764123. DOI: [10.1073/pnas.2524764123](https://doi.org/10.1073/pnas.2524764123). arXiv: [2603.01808](https://arxiv.org/abs/2603.01808).
- Xiao, Guang-Yao, Fabo Feng, Song Wang, Kai Li, **Yicheng Rui**, and Xiao-Wei Duan (2026). “Detection of Dark Companions via The Combination of Eclipse Timing Variation, Hipparcos, and/or Gaia Astrometry: The Cases of V Puppis and CY Ari”. In: *The Astrophysical Journal* 998.1, p. 155. DOI: [10.3847/1538-4357/ae314c](https://doi.org/10.3847/1538-4357/ae314c). arXiv: [2512.20087](https://arxiv.org/abs/2512.20087).
- Zheng, Shuyue, Fabo Feng, and **Yicheng Rui** (2026). “Segmented-Polynomial-fitting Least Squares (SPLS): An Optimized Algorithm to Find Earth Twins”. In: *The Astronomical Journal* 171.2, p. 64. DOI: [10.3847/1538-3881/ae2679](https://doi.org/10.3847/1538-3881/ae2679). URL: <https://doi.org/10.3847/1538-3881/ae2679>.
- Zhang, Luyao, Fabo Feng, **Yicheng Rui**, Guang-Yao Xiao, and Wenting Wang (2025). “A Cartesian Catalog of 30 Million Gaia Sources Based on Second-order and Monte Carlo Error Propagation”. In: *Research in Astronomy and Astrophysics* 25.5, p. 055010. DOI: [10.1088/1674-4527/adc6da](https://doi.org/10.1088/1674-4527/adc6da). URL: <http://dx.doi.org/10.1088/1674-4527/adc6da>.
- Feng, Fabo, **Yicheng Rui**, Yifan Xuan, and Hugh Jones (2024). “Modeling and Calibration of Gaia, Hipparcos, and Tycho-2 Astrometric Data for the Detection of Dark Companions”. In: *The Astrophysical Journal Supplement Series* 271.2, p. 50. DOI: [10.3847/1538-4365/ad27d2](https://doi.org/10.3847/1538-4365/ad27d2). URL: <https://doi.org/10.3847/1538-4365/ad27d2>.
- Pang, Xiaoying, Yifan Wang, Shih-Yun Tang, **Yicheng Rui**, Jing Bai, Chengyuan Li, Fabo Feng, M. B. N. Kouwenhoven, Wen-Ping Chen, and Rwei-ju Chuang (2023). “Binary Star Evolution in Different Environments: Filamentary, Fractal, Halo, and Tidal Tail Clusters”. In: *The Astronomical Journal* 166.3, p. 110.

Cao, Sizheng, Xian-Hui Ge, and **Yicheng Rui** (2026). “Thermodynamic and real-time dynamic properties of complex Sachdev–Ye–Kitaev model”. In: *Chinese Physics B* 35.6, p. 060512. DOI: [10.1088/1674-1056/ae48c6](https://doi.org/10.1088/1674-1056/ae48c6). arXiv: [2103.16270](https://arxiv.org/abs/2103.16270).

Preprints and submitted manuscripts

Yicheng Rui[†] (2026). *Domain-Informed Multi-View Self-Distillation for Astronomical Light-Curve Representation Learning with JEPA*. Preprint. arXiv: [2606.28446](https://arxiv.org/abs/2606.28446). URL: <https://arxiv.org/abs/2606.28446>.

Zhang, Fei, **Yicheng Rui**[†], Yide Jing, YuLong Gao, and Zheng-jun Du (2026). *A Unified Deep Network Model for Transient and Moving Source Detection*. Submitted to PASP.

Selected computational outputs

- [Agentic light-curve diagnosis](#): catalog queries, period searches, diagnostic plots, and evidence-based variable-star assessments; ongoing development.
- [Tianyu pipeline](#): distributed image calibration, alignment, photometry, and light-curve production; associated PASP publication above.
- [LenghuSky-8](#): calibrated all-sky images and cloud-analysis tools; associated CVPR Findings paper above.
- [DeepAP](#): learned photometry feasibility assessment and aperture selection; associated RAA publication above.
- Terminal-Bench Science: contributed [variable-star vetting](#) and [joint RV–astrometry inference](#) evaluation tasks, and served as a reviewer.

AstroSkyFlow and the light-curve representation model are additional computational outputs described in the papers above. These entries identify software contributions, not additional publications.