

Yingtian “Bill” Chen

Ph.D. candidate and Rackham Predoctoral Fellow

Version: February 2026

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Education

- **University of Michigan Department of Astronomy** | Ann Arbor, US 2020 – 2026
Ph.D. candidate in Astronomy and Astrophysics
M.S. in Astronomy and Astrophysics
- **Peking University School of Physics** | Beijing, China 2016 – 2020
B.S. in Physics (with honours)

Experience

- **MIT Kavli Institute (MKI)** | Cambridge, US 2019
Visiting Researcher

Research Interests

Star clusters · Stellar streams · Galaxy formation · Galactic Archaeology · Computational astronomy

- Probing the structure and evolution of galaxies and star clusters via stellar streams.
- Galaxy and star cluster formation in cosmological zoom-in simulations.
- Semi-analytical modeling of star cluster evolution in galactic environment.

Honours and Awards

- **Rackham Conference Travel Grant** × 3, UM 2023 – 2026
- **Rackham Predoctoral Fellowship**, UM 2025
- **Rackham International Student Fellowship**, UM 2021
- **Weiming Physics Scholarship**, PKU 2020
- **Outstanding Graduate** of Beijing 2020
- **First Prize + Best speaker**, Xingcheng Forum, PKU 2019
- **Huabao Funding for Undergraduate Research Program**, PKU 2018
- **National Scholarship** 2018
- **Pacemaker to Merit Student**, PKU 2018
- **Outstanding Winner + SIAM Award**, Mathematical Contest in Modeling 2018
- **Gold Medal**, Chinese Physics Olympiad 2015

Selected Talks

- **Dissertation Talk**, AAS 247 | Phoenix, US 2026
- **Invited Talk**, *S5 telecon* | Remote 2025
- **Invited Talk** × 2, *DESI MWS telecon* | Remote 2024 – 2025
- **Invited Seminar**, *Carnegie Observatories Stream Team meeting* | Remote 2025
- **Invited Seminar**, *lunch talk*, Penn State | University Park, US 2025
- **Conference Talk + Poster**, *Gravity in the Local Group*, CMU | Pittsburgh, US 2025
- **Invited Seminar**, *KICP seminar*, UChicago | Chicago, US 2025
- **Invited Seminar**, *Nearby Universe group meeting*, CCA, Flatiron Institute | New York, US 2025
- **Invited Seminar**, American Museum of Natural History | New York, US 2025
- **Lunch Talk** × 5, *Astronomy grad lunch talk series*, UM | Ann Arbor, US 2021 – 2025

• Poster + Flash Talk , <i>DGSCS 2024</i> , UChicago Chicago, US	2024
• Invited Seminar , <i>Galaxy Formation seminar</i> , CCA, Flatiron Institute New York, US	2024
• Invited Talk , UChicago Remote	2024
• Invited Talk , <i>SMWLVS Star Clusters Working Group meeting</i> Remote	2023
• Conference Talk , <i>MODEST-23</i> , NU Evanston, US	2023
• Conference Talk , <i>Great Lakes Clusters and Streams</i> , UM Ann Arbor, US	2023
• Talk , <i>Seminar for undergraduate students</i> , PKU Beijing, China	2019
• Talk , <i>Xingcheng Forum</i> , PKU Beijing, China	2019
• Talk , <i>Seminar for theoretical physics</i> , FDU Shanghai, China	2019

Student Supervision

• Colin Holm-Hansen, <i>Generating mock catalogs of stellar streams in simulated Milky Way-like galaxies</i> (co-supervised with Oleg Gnedin), UM grad student	Since 2024
• Brigitte Vazquez Segovia, <i>Modeling subhalo interactions in the GD-1 stellar stream</i> (co-supervised with Monica Valluri), UM grad student	Since 2024

Professional Service

• Referee of Journal Articles , A&A · ApJ · MNRAS	Since 2023
• Conference Session Chair , <i>DGSCS 2024</i> , UChicago Chicago, US	2024
• Conference LOC Chair , <i>Great Lakes Clusters and Streams</i> , UM Ann Arbor, US	2023
• Organizer , <i>Stellar Halos Group meeting</i> (weekly), UM Ann Arbor, US	Since 2024

Code Development

• Author , StarStream , <i>Automatic detection method for stellar streams</i>	Since 2025
• Author , GC_formation_model , <i>Semi-analytical model of globular cluster formation</i>	Since 2023
• Author , prj_plotter , <i>Density projection tool for simulations using quadtree</i>	Since 2022
• Author , mesh_illustris , <i>Fast toolkit to analyze Illustris data with mesh</i>	Since 2021
• Contributor , gala , <i>Python package for galactic and gravitational dynamics</i>	Since 2024
• Contributor , galax , <i>JAX-based package for galactic and gravitational dynamics</i>	Since 2024
• Contributor , galpy , <i>Python package for galactic dynamics</i>	Since 2024
• Contributor , ART , <i>Simulation code using adaptive mesh refinement</i>	Since 2023
• Public Software , fov_simulator , <i>Simulator of camera field of view for astrophotography</i>	Since 2025

University Service

• Organizer , <i>Astronomy grad lunch talk series</i> (weekly)	2024 – 2026
• Organizer , <i>Build-Your-Website workshop</i>	2025
• Organizer , <i>Astrocoffee journal club</i> (bi-weekly)	2022 – 2025
• Organizer , <i>Preliminary examination preparation club</i> (weekly)	2022 – 2025
• Chair , <i>UM Chinese astronomers networking group</i>	Since 2022
• Department Bread Baker (weekly)	2021 – 2022

Outreach

• Public Talk , <i>How scientists find black holes</i> , UM museum of natural history Ann Arbor, US	2025
• Public Seminar , <i>Reductionism and holism</i> , Yuexia Space seminar series Shenzhen, China	2021
• Guest Lecturer , <i>Physics Olympiad training</i> , Chengdu Jinjiang Jiaxiang Foreign Language Senior High School Chengdu, China	2017
• Online Tutorial , <i>2D Ising model in Matlab and Python</i> , published on GitHub and Zhihu	2019
• Online Tutorial , <i>BP neural network in Matlab</i> , published on GitHub	2018

Teaching

- **Guest Lecturer**, *Hamiltonian Mechanics*, UM | Ann Arbor, US 2025
Galactic Dynamics Summer Workshop
- **Guest Lecturer**, *Cosmological N-body Simulations*, UM | Ann Arbor, US 2025
ASTRO 534: The Extragalactic Universe (grad-level cosmology)
- **Teaching Assistant**, UM | Ann Arbor, US 2021 & 2024
ASTRO 104: Alien Skies: A Tour Through the Universe
ASTRO 106: Aliens
ASTRO 115: Introductory Astrobiology: The Search for Life in the Universe

Skills

High performance computing · Data analysis and visualization · Machine learning · Web development

- **Programming Languages:** C/C++ · Python · Latex · MATLAB · HTML/CSS
- **Software/Packages:** ART · AREPO · GADGET · PeTar · MPI · AGAMA · multiprocessing · NumPy · Matplotlib · SciPy · scikit-learn · PyTorch · Astropy · yt · gala · galax · galpy · Bootstrap · Git
- **Languages:** Mandarin Chinese (native) · English (fluent)

References

- **Dr. Oleg Y. Gnedin** (Ph.D. advisor), Professor, UM ognedin@umich.edu
- **Dr. Monica Valluri**, Research Professor, UM mvalluri@umich.edu
- **Dr. Hui Li**, Assistant Professor, THU hliastro@tsinghua.edu.cn

Publications

- 14 in total = 10 as first author + 1 by supervised students + 3 as contributing author
- First-author citations > 180 · h-index = 7
- Total citations > 200 · h-index = 8

Publications as First Author

1. **Yingtian Chen**[✉], Oleg Y. Gnedin, and Adrian M. Price-Whelan, *StarStream on Gaia: Stream discovery and mass loss rate of globular clusters*, accepted by ApJS [arXiv:2510.14924] 2025
2. **Yingtian Chen**[✉], Oleg Y. Gnedin, Adrian M. Price-Whelan, and Colin Holm-Hansen, *StarStream: Automatic detection algorithm for stellar streams*, ApJ **995**, 15 2025
3. **Yingtian Chen**[✉], Hui Li[✉], and Oleg Y. Gnedin, *Stellar streams reveal the mass loss of globular clusters*, ApJL **980**, L18 2025
4. **Yingtian Chen**[✉], Monica Valluri, Oleg Y. Gnedin, and Neil Ash, *Improved particle spray algorithm for modeling globular cluster streams*, ApJS **276**, 32 2025
5. **Yingtian Chen**[✉] and Oleg Y. Gnedin, *Galaxy assembly revealed by globular clusters*, OJAp **7**, 23 2024
6. **Yingtian Chen**[✉] and Oleg Y. Gnedin, *Catalogue of model star clusters in the Milky Way and M31 galaxies*, MNRAS **527**, 3692 2024
7. **Yingtian Chen**[✉] and Oleg Y. Gnedin, *Formation of globular clusters in dwarf galaxies of the Local Group*, MNRAS **522**, 5638 2023
8. **Yingtian Chen**[✉] and Oleg Y. Gnedin, *Modeling the kinematics of globular cluster systems*, MNRAS **514**, 4736 2022
9. **Yingtian Chen**, Hui Li[✉], and Mark Vogelsberger, *Effects of initial density profiles on massive star cluster formation in giant molecular clouds*, MNRAS **502**, 6157 2021
10. **Yingtian Chen** and Bo-Qiang Ma[✉], *Novel pre-burst stage of gamma-ray bursts from machine learning*, JHEAp **32**, 78 2021

Publications by *Supervised Students

11. *Colin Holm-Hansen[✉], **Yingtian Chen**, and Oleg Y. Gnedin, *Catalog of Mock Stellar Streams in Milky Way-like Galaxies*, submitted to OJAp [arXiv:2510.09604] 2025

Publications as Contributing Author

12. Brandon Sike[✉], Mateusz Ruszkowski, Oleg Y. Gnedin, **Yingtian Chen**, et al., *Resolving star cluster formation in galaxy simulations with cosmic ray feedback*, submitted to AAS journals [arXiv:2510.06134] 2025
13. Neil Ash[✉], Monica Valluri, **Yingtian Chen**, and Eric F. Bell, *Stellar bars form dark matter counterparts in TNG50*, ApJ **976**, 189 2024
14. Sarah Pearson[✉], Ana Bonaca, **Yingtian Chen**, and Oleg Y. Gnedin, *Forecasting the population of globular cluster streams in Milky Way-type galaxies*, ApJ **976**, 54 2024