Yingtian "Bill" Chen

Ph.D. candidate and Rackham Predoctoral Fellow

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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**, *DGSCS 2024*, UChicago | Chicago, US — 2024
- **Invited Seminar**, *Galaxy Formation seminar*, CCA, Flatiron Institute | New York, US — 2024
- **Invited Talk**, UChicago | Remote — 2024
- **Invited Talk**, *SMWLV Star Clusters Working Group meeting* | Remote — 2023
- **Conference Talk**, *MODEST-23*, NU | Evanston, US — 2023
- **Conference Talk**, *Great Lakes Clusters and Streams*, UM | Ann Arbor, US — 2023
- **Talk**, *Seminar for undergraduate students*, PKU | Beijing, China — 2019
- **Talk**, *Xingcheng Forum*, PKU | Beijing, China — 2019
- **Talk**, *Seminar for theoretical physics*, FDU | Shanghai, China — 2019

Student Supervision

- Colin Holm-Hansen, *Generating mock catalogs of stellar streams in simulated Milky Way-like galaxies* (co-supervised with Oleg Gnedin), UM grad student — Since 2024
- Brigette Vazquez Segovia, *Modeling subhalo interactions in the GD-1 stellar stream* (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**, *DGSCS 2024*, UChicago | Chicago, US — 2024
- **Conference LOC Chair**, *Great Lakes Clusters and Streams*, UM | Ann Arbor, US — 2023
- **Organizer**, *Stellar Halos Group meeting* (weekly), UM | Ann Arbor, US — Since 2024

Code Development

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

University Service

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

Outreach

- **Public Talk**, *How scientists find black holes*, UM museum of natural history | Ann Arbor, US — 2025
- **Public Seminar**, *Reductionism and holism*, Yuexia Space seminar series | Shenzhen, China — 2021
- **Guest Lecturer**, *Physics Olympiad training*, Chengdu Jinjiang Jiaxiang Foreign Language Senior High School | Chengdu, China — 2017
- **Online Tutorial**, *2D Ising model in Matlab and Python*, published on GitHub and Zhihu — 2019
- **Online Tutorial**, *BP neural network in Matlab*, 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(at)umich.edu
- **Dr. Monica Valluri**, Research Professor, UM ✉mvalluri(at)umich.edu
- **Dr. Hui Li**, Assistant Professor, THU ✉hliastro(at)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] [press release]. 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 [press release]. 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