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

- **Visiting Researcher**, MIT Kavli Institute | Cambridge, US — 2019

Research Interests

Star clusters (1567) · Stellar streams (2166) · Computational astronomy (293)

- Probin g 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.

See the detailed description of my research

Publications

See the complete list of publications in ADS

- **14** in total = **10** as first author + **1** by supervised students + **3** as contributing author
- First-author citations > 160 · h-index = 7
- Total citations > 180 · h-index = 8

Honours and Awards

- **Rackham Predoctoral Fellowship**, UM — 2025
- **Rackham Conference Travel Grant** × 2, UM — 2023 & 2024
- **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

Awarded Resources

- **Co-PI**, ACCESS *Maximize* AST200017, awarded allocation ≈ 50K USD — 2025 – 2026
  171K SUs (≈10M CPU hours) @ TACC/Stampede3 + 256 TB @ TACC/Ranch
- **Co-PI**, ACCESS *Accelerate* AST200017, awarded allocation ≈ 30K USD — 2024 – 2025
  116K SUs (≈6M CPU hours) @ TACC/Stampede3 + 100 TB @ TACC/Ranch

Selected Talks

- **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** $\times$ 5, *Astronomy grad lunch talk series*, UM | Ann Arbor, US — 2021 – 2025
- **Invited Talk**, *DESI MWS telecon* | Remote — 2024
- **Poster + Flash Talk**, *DGSCS 2024*, UChicago | Chicago, US — 2024
- **Invited Seminar**, PKU · THU · SHNU · SHAO · SJTU · PMO · NJU · ZJU | Beijing · Shanghai · Nanjing · Hangzhou, China — 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

See my GitHub profile

- **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** (李辉), Assistant Professor, THU ✉`hliastro(at)tsinghua.edu.cn`

Publications

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- **14** in total = **10** as first author + **1** by supervised students + **3** as contributing author
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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*, submitted to AAS journals [arXiv:2510.14924] [ADS]. 2025
2. **Yingtian Chen**✉, Oleg Y. Gnedin, Adrian M. Price-Whelan, and Colin Holm-Hansen, *StarStream: Automatic detection algorithm for stellar streams*, accepted by ApJ [arXiv:2510.14929] [ADS]. 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] [ADS]. 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] [ADS]. 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

Publications in Prep.

15. **Yingtian Chen**✉, Oleg Y. Gnedin, Vadim A. Semenov, and Hui Li, *Simulating clustered star formation in the early Universe*, in prep. 2025