

Zirui Chen

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EDUCATION & PROFESSIONAL EXPERIENCE

Columbia University, NY, USA

B.A. in Physics and Astronomy (GPA 4.06/4.3)

Advisors: Greg Bryan, Drummond Fielding, David Kipping

September 2018–May 2022

Center for Computational Astrophysics, Flatiron Institute, NY, USA

Guest Researcher

May 2022–August 2022

University of California, Santa Barbara, CA, USA

M.A. and Ph.D. in Astrophysics (GPA 3.9/4.0)

Advisor: S. Peng Oh

September 2022–Present

AWARDS & HONORS

- James and Mary Jo Hartle Graduate Fellowship (UCSB) September 2022
- Summa Cum Laude (Columbia) May 2022
- Departmental Honor, Physics (Columbia) May 2022
- The Phi Beta Kappa Society (Columbia) December 2021
- John Jay Scholar (Columbia) September 2018–May 2022
- Dean's List (Columbia) September 2018–May 2022

RESEARCH INTERESTS

- Modeling Astrophysical Turbulence Using Stochastic Differential Equations, Topology, and More
- Studying Galaxy Evolution through Numerical Simulations; Computational Astrophysics
- Dynamics of Multiphase Gas in the Circumgalactic Medium and Galactic Winds

SKILLS

- Building Quantitative Models to Explain Noisy Real-World Data.
- Coding (Python & C++); Cluster Computing; Running Large-Scale Numerical Simulations.
- Order of Magnitude Estimates; Back-of-the-Envelope Calculations.

PUBLICATIONS

- First-Author Publications: 5 – Citations: 48

1. **Zirui Chen** and S. Peng Oh, “[From Clumps to Sheets: Geometry Controls the Temperature PDF of Multi-Phase Gas](#)”, 2026, Submitted to The Open Journal of Astrophysics.
2. **Zirui Chen** and S. Peng Oh, “[The Survival and Entrainment of Molecules and Dust in Galactic Winds](#)”, 2024, Monthly Notices of the Royal Astronomical Society, 530, 4032.

3. **Zirui Chen**, Zixuan Peng, Kate H. R. Rubin et al., “[Modeling Emission-Line Surface Brightness in a Multiphase Galactic Wind: An O VI Case Study](#)”, 2026, Accepted for publication in Monthly Notices of the Royal Astronomical Society
4. **Zirui Chen**, Drummond Fielding, and Greg Bryan, “[The Anatomy of a Turbulent Radiative Mixing Layer: Insights from an Analytic Model with Turbulent Conduction and Viscosity](#)”, 2023, The Astrophysical Journal, 950, 91.
5. Zixuan Peng, Crystal Martin, **Zirui Chen**, Drummond B. Fielding, et al., “[Physical Origins of Outflowing Cold Clouds in Local Star-Forming Dwarf Galaxies](#)”, 2025, The Astrophysical Journal, 981, 171.
6. **Zirui Chen** and David Kipping, “[The Number of Transits Per Epoch for Transiting Misaligned Circumbinary Planets](#)”, 2022, Monthly Notices of the Royal Astronomical Society, 513, 5162.

GRANTS & PROPOSALS

- Hubble Space Telescope Cycle 32 Archival Research Proposal, ID 17860, **Co-PI** October 2024
 “Interface: A New Tool for Generating Absorption and Emission Spectra from Multi-Phase Mixing Layers” .
 Received funding for a senior graduate student for 6 months (**\$50,000.00**) amid significant funding cuts at NASA.
- Non-thermal Processes at Multiphase Boundaries in the Interstellar and Circum-galactic Medium, ACCESS PHY240194, **Co-PI** October 2024
107.6k node hours and **200kGB archival storage** on the Stampede3 computing cluster at UT Austin. The estimated value of these awarded resources is **\$63,800.00**.
- Turbulence and Thermally Unstable Gas, ACCESS PHY240001, **PI** January 2024
400k ACCESS credits on 40+ NSF supported computing clusters in the US.
- Molecular Cloud in Galactic Winds, ACCESS PHY230107, **PI** July 2023
400k ACCESS credits on 40+ NSF supported computing clusters in the US.

INVITED TALKS

- [Astronomy on Tap](#), Santa Barbara (Astronomy Talk at a Bar) February 2025
- [GalFRESCA](#), Carnegie Observatories (Southern California Galaxy Formation & Evolution Meeting) September 2024
- [UCSB Astro Lunch](#) November 2023
- [Center for Computational Astrophysics Galaxy Formation Group Meeting](#) November 2023
- Center for Computational Astrophysics & Tel Aviv University Galaxy Formation Workshop June 2022
- Columbia University AstroFest (Poster Presentation) September 2021

STUDENT ADVISING

- Youxing Xu, 3rd Year Undergraduate Student, UCSB January 2024–June 2024
 Advised undergraduate student Youxing on testing the convergence of cold gas column density in cosmological simulations.

TEACHING & OUTREACH

- Teaching Assistant, UCSB September 2022–June 2024
 Astro 1 (introductory astronomy course); Physics 4L, 6AL, and 6BL (introductory experimental physics course).
- Volunteer, Columbia Astronomy Outreach Program September 2018–May 2022
 Organized and publicized bimonthly lecture series and stargazing events for Columbia and the public.