

YIXIAN CHEN

Email: yc9993@princeton.edu

EDUCATION

Department of Astrophysical Sciences, [Princeton University](#)

Princeton

PhD in Astrophysical Sciences; Advisor: Jeremy Goodman

Sep 2021 – Expected June 2026

- **Research Interests:**

Planetary astrophysics: Planet formation and migration in protoplanetary disks; Observable signatures of planet-disk interactions; Dust evolution in protoplanetary disks; Planet atmospheres and spectra

AGN Disks: Gravitational Instability and MRI in accretion disks; Formation and evolution of Stars and Black Holes in AGN Disks; Tidally distorted and warped accretion disks; Extreme (eccentric, inclined) orbiters

- **Awards & Honors:**

Princeton First Year Fellowship in Natural Science & Engineering, 2021 (\$90k)

[Citadel GQS PhD Fellowship](#), 2024 (\$100k, one recipient among all physics PhD in the US)

Department of Physics, [Tsinghua University](#)

Beijing

Bachelor in Physics; Advisor: Douglas N. C. Lin

Sep 2017 - Jun 2021

- **Awards & Honors:**

Chi-Sun Yeh Scholarship (Highest Honor for Physics Major), 2021

[Tsinghua University Prestigious Scholarship](#) (Highest Honor for Undergraduates, 10 per year), 2020

Lin-bridge Scholarship (Awarded for Excellent Astrophysical Research), 2020

Nan-Xiang Jiang Scholarship (Highest Honor for Juniors), 2019

Dec. 9th Scholarship (Highest Honor for Sophomores), 2018

- **Programs:**

Member of Tsinghua University Spark project, research scholar cultivation program

University of California, Berkeley

Berkeley

Exchange Program

Aug 2019 - Dec 2019

ACADEMIC REFERENCES

- Professor Douglas N. C. Lin, UC Santa Cruz & Tsinghua University
- Professor Jeremy Goodman, Princeton
- Professor Eve Ostriker, Princeton
- Professor Adam Burrows, Princeton
- Professor James Stone, Institute for Advanced Study
- Dr Yan-Fei Jiang, Flatiron Institute

LEADING-AUTHOR PUBLICATIONS

1. **Chen Y.X.***, Li Y.P., Li H., Lin D.N.C., [The Preservation of Super Earths and the Emergence of Gas Giants after Their Progenitor Cores Have Entered the Pebble Isolation Phase](#), ApJ, 896, 135
2. **Chen Y.X.***, Zhang X., Li Y.P., Li H., Lin D.N.C., [Retention of Long-Period Gas Giant Planets: Type II Migration Revisited](#), ApJ, 900, 44
3. Li Y.P.*, **Chen Y.X.***, Lin D.N.C., Zhang X., [Accretion of Gas Giants Constrained by the Tidal Barrier](#), ApJ, 906, 52

4. **Chen Y.X.***, Wang Z., Li Y.P., Baruteau C., Lin D.N.C., [*Wide Dust Gaps in Protoplanetary Disks Induced by Eccentric Planets: A Mass-Eccentricity Degeneracy*](#), ApJ, 922, 184
5. Li R.*, **Chen Y.X.**, Lin D.N.C., [*Dust Accumulation near the Magnetosphere Truncation of Protoplanetary Discs around T Tauri Stars*](#), MNRAS, 510, 5246
6. Li Y.P.*, **Chen Y.X.***, Lin D.N.C., Wang Z., [*Spin Evolution of Stellar-mass Black Holes Embedded in AGN disks: Orbital Eccentricity Produces Retrograde Circumstellar Flows*](#), ApJL, 928, 1
7. Zhou T., Deng H., **Chen Y.X.***, Lin D.N.C., [*Turbulent Transport of Dust Particles in Protoplanetary Disks: The Effect of Upstream Diffusion*](#), ApJ, 940, 117
8. **Chen Y.X.***, Bailey A., Stone J., Zhu Z., [*Prograde and Retrograde Gas Flow around Disk-embedded Companions: Dependence on Eccentricity, Mass and Disk Properties*](#), ApJL, 939, 23
9. **Chen Y.X.***, Jiang Y.F., Goodman J., Ostriker E., [*3D Radiational Hydrodynamics Simulations of Gravitational Instability in AGN Disks: The Effects of Radiation Pressure*](#), ApJ, 948, 120
10. **Chen Y.X.***, Lin D.N.C., [*Chaotic Gas Accretion by Black Holes Embedded in AGN Disks as Cause of Low-spin Signatures in Gravitational Wave Events*](#), MNRAS, 522, 319
11. Wu Y.†*, **Chen Y.X.†***, Jiang H.†*, et al., [*Distinguishing Magnetized Disc Winds from Turbulent Viscosity through Substructure Morphology in Planet-forming Discs*](#), MNRAS, 523, 2630
12. **Chen Y.X.***, Burrows A., Sur A., Arevalo R.T., [*Jupiter Atmospheric Models and Outer Boundary Conditions for Giant Planet Evolutionary Calculations*](#), ApJ, 957, 36
13. Li Y.P.*, **Chen Y.X.**, Lin D.N.C., [*3D Global Simulations of Accretion onto Gap-opening Planets: Implications for Circumplanetary Disc Structures and Accretion Rates*](#), MNRAS, 526, 5346
14. Wu Y.*, **Chen Y.X.***, Lin D.N.C., [*Chaotic Type I Migration in Turbulent Discs*](#), MNRAS Letters, 528, 127
15. Li R.*, **Chen Y.X.**, Lin D.N.C., [*Dust Accumulation near the Magnetosphere Truncation of Protoplanetary Discs around T Tauri Stars II. The Effects of Opacity and Thermal Evolution*](#), MNRAS, 529, 893
16. **Chen Y.X.***, Lin D.N.C., [*The Population of Massive Stars in AGN Disks*](#), ApJ, 967, 88
17. Li Y.P.*, **Chen Y.X.**, Lin D.N.C., [*Concurrent Accretion and Migration of Giant Planets in their Natal Disks with Consistent Accretion Torque*](#), ApJ, 971, 130
18. **Chen Y.X.***, Jiang Y.F., Goodman J., Lin D.N.C., [*Radiation Hydrodynamic Simulations of Massive Stars in Gas-rich Environments: Accretion of AGN Stars Suppressed By Thermal Feedback*](#), ApJ, 974, 106
19. Wu Y.*, **Chen Y.X.***, [*Planet Migration in Windy Discs*](#), MNRAS Letters, 536, 13
20. **Chen Y.X.***, Jiang Y.F., Goodman J., [*Accretion of AGN Stars Under Influence of Disk Geometry*](#), ApJ, 987, 188
21. **Chen Y.X.*†**, Wu Y.*†, Lin D.N.C., et al., [*Capture and Escape of Planetary Mean-motion Resonances in Turbulent Discs*](#), MNRAS, 540, 1998
22. **Chen Y.X.***, Metzger B., et al., *Gravitational Instability in Neutron-rich Collapsar Disks and Formation of Sub-solar Neutron Stars*, to be submitted

* indicates corresponding author, † indicates equal contribution

See list of publication on [arXiv](#)

SELECTED SCIENTIFIC TALKS

- **Capture & Escape of Planet Mean Motion Resonances in Turbulent Discs**
Seminar Talk, Invited by University of Hawaii
Honolulu
May 2025
- **Understanding Star Formation and Evolution in AGN Disks**
Seminar Talk, Invited by UNLV, Caltech
Las Vegas, Pasadena
May 2025
- **Accretion of Massive Stars in Gas-rich Environments**
Oral Presentation, AAS 245
Washington DC
Jan 2025
- **Unorthodox Planet-disk Interaction: Eccentricity, Turbulence and Wind**
Invited Talk, given at NAOJ & Kobe University
Tokyo & Kobe
May 2024
- **Accretion of Massive Stars Limited by Radiative Feedback**
Invited Talk, Columbia University High Energy Group Discussion
New York City
April 2024
- **Stellar Object Formation and Evolution in AGN Disks**
Seminar Talk, Invited by Tsinghua University, Shanghai Observatory, TD Lee Institute etc.
Shanghai & Beijing
May 2023
- **Enhancement of Star Formation in AGN Disks by Radiation Pressure**
Oral Presentation, 2nd Athena++ Workshop (Jimfest)
New York City
May 2023
- **3D RHD Simulations of Gravitational Instability in AGN Disks**
Oral Presentation, AAS 240
Pasadena, California
Jun 2022
- **Understanding Migration of Gas Giants**
Oral Presentation, Exoplanet IV
Las Vegas, Nevada
Apr 2022
- **Accretion of Gas Giants Constrained by the Tidal Barrier**
Online Talk, invited by UArizona Planet Group
Tucson, Arizona (Virtual)
Dec 2020
- **The Lense-Thirring Precession and Warped Accretion Disks**
Final project for Advanced General Relativity
Beijing
Dec 2020
- **The Preservation of Hot Super Earths and Cold Gas Giants**
Online Talk, invited by UArizona Planet Group
Tucson, Arizona (Virtual)
Jun 2020
- **Introduction to Planetary Astrophysics**
Chi-sun Yeh Academic Lectures, Tsinghua University
Beijing
Jun 2020
- **Formation of Close-in Planets (sub-Neptunes/super-Earths)**
Department of Astronomy (DoA) seminar on theoretical astrophysics, Tsinghua University
Beijing
Apr 2020
- **Galactic Center Microlensing**
Report of research project, Moving Universe Group Meeting
Berkeley, California
Dec 2019
- **Dust Diffusion in Protoplanetary Disks and Formation of super Earths**
Report of research project, Formation and Evolution of Planetary System Conference
Urumqi
Jul 2019
- **Linear Magneto-Rotational Instability**
Beijing

CONFERENCES & WORKSHOPS

- **AAS 242 Meeting, Washington DC** Jan 2025
- **Frontiers of Astrophysics Forum, Shanghai** July 2024
- **Accretion Modified Stars in AGNs II, Wuhan** June 2024
- **Accretion Modified Stars in AGNs, Nanjing** June 2023
- **Center of Computational Astrophysics Athena++ Workshop, New York** May 2023
- **Where are the Objects in AGN Disks? Santa Fe** March 2023
- **AAS 240 Meeting, Pasadena** June 2022
- **Exoplanet IV, Las Vegas** May 2022
- **IMPRS Summer School on “Planet Formation in Protoplanetary Disks”, Heidelberg (Virtual)** August 2020
- **Exoplanets III, Heidelberg (Virtual)** July 2020
- **Sagan Workshop on Extreme Precision Radial Velocity, Pasadena, California (Virtual)** July 2020
- **Formation and Evolution of Planetary System Seminar, Urumqi, Xinjiang** July 2019
- **Astrophysical Dynamics Conference, Shanghai** July 2019

PROFESSIONAL SERVICES

Referee: ApJ, MNRAS, Icarus, A&A, NASA Research

Outreach: Guest Lecturer for Winchester College Astronomy Day (2024, theme: planetary astrophysics), Organizer of Princeton Astrophysics Thursday Lunch Talk (2022), Princeton Astro-coffee host (2024-)

Teaching: *The Universe* (Assistant Instructor, 2023 Spring, Princeton undergraduate course)

STUDENTS ADVISED

- **Max Qiu (Grade 12, now at Harvey Mudd College)** Nov 2022 - May 2023
ISEF (International Science and Engineering Fair) Project: *Enhanced Microlensing in the Galactic Center*
- **Jeff Ho (Grade 12, now at Columbia University)** May 2023 - Aug 2023
S. T. Yau High School Science Fair Project: *Structure of AGN Disks Across A Wide Range of Parameter Space*
- **Patrick Li (Grade 11)** Nov 2023 -
Solving Quasi-periodic Orbits with A Novel Galerkin Method

SKILLS AND INTERESTS

Language Abilities:

- Chinese: Mandarin (native), Cantonese
- Japanese (N2)
- English: fluent, I had the honor of representing China in international speech contests

Awards & Honors:

- *China Daily English Speaking Competition (College Group)* [National Championship](#), 2019
- *English Speaking Union International Public Speech Contest (IPSC)* [Finalist/Third Place](#), 2019
- *China Daily English Speaking Competition (High School Group)* *National Championship*, 2017
- Featured in official International Promotion Video for Tsinghua University: [Beyond the Pages](#)

Programming Languages: Mathematica, Matlab, python, C++, HTML, LaTeX

Professional Software: FARGO3D, RADMC-3D, Athena++, CoolTLusty, MESA

Music and Vocal performance:

- Former Member of Tsinghua University chorus and Berkeley Chinese Acappella, performed in various concerts and competitions
- I won Champion of The Voice of Princeton in 2024 (voted by audiences) by performing an adapted version of [*When We Were Young*](#).
- Other selected vocal performances: [*My Way*](#), [*Wandering Earth Theme*](#), [*Keep me by your Side \(让我留在你身边\)*](#), [*葡萄成熟时*](#), [*This is the Moment*](#), [*Shall We Talk*](#), [*任我行*](#), [*昴-すばる*](#)

Film production:

- Wrote screenplays for and produced short play *Ode to Guitar (2018)* and short sci-fi film [*A Wicked Letter Through Time \(2019\)*](#)