

# YI-XIAN CHEN (陈逸贤)

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## EDUCATION

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### 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 GOS PhD Fellowship](#), 2024* (\$100k, only 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 \(特等\) 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. 9<sup>th</sup> 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

## LEADING-AUTHOR PUBLICATIONS

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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., *Massive Stars Accreting in AGNs: Effect of Disk Geometry*, in preparation

\* indicates corresponding author, † indicates equal contribution

See list of publication on [arXiv](#)

## ACADEMIC REFERENCES

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

## SELECTED SCIENTIFIC TALKS

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- **Unorthodox Planet-disk Interaction: Eccentricity, Turbulence and Wind**

Tokyo & Kobe

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

## CONFERENCES & WORKSHOPS

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- **Frontiers of Astrophysics Forum, Shanghai** July 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

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## PROFESSIONAL SERVICES

**Referee:** MNRAS, Icarus, A&A

**Outreach:** Guest Lecturer for Winchester College Astronomy Day (2024), Organizer of Princeton Astrophysics Thursday Lunch Talk (2022)

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

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## 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*

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## SKILLS AND INTERESTS

### Language Abilities:

- Chinese: Mandarin (native), Cantonese
- Japanese (N2)
- English: fluent oral speaker, 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 English Promotion Video for Tsinghua University: [Beyond the Pages](#)

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

**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 \(2019\)](#)