

YI-XIAN CHEN (陈逸贤)

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EDUCATION

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

Princeton

PhD in Astrophysical Sciences

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

General application of accretion disk theory: Gravitational Instability and MRI in accretion disks; Formation and evolution of stellar objects embedded in AGN disks; Tidally distorted and warped accretion disks; Extreme (eccentric, inclined) orbiters

Department of Physics, [Tsinghua University](#)

Beijing

Bachelor in Physics

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. 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

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.†*, Dong R., 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 in press
14. 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*, revised for MNRAS
15. Wu Y.*, **Chen Y.X.***, Lin D.N.C., *Chaotic Type I Migration in Turbulent Discs*, revised for MNRAS Letters
16. **Chen Y.X.***, Lin D.N.C., Chen X., et al., *A Swarm of Massive Stars Embedded in AGN Disks: Population and Dynamical Constraints*, in preparation

* indicates corresponding author, † indicates equal contribution

See list of publication on [arXiv](#)

SELECTED SCIENTIFIC TALKS

- **Stellar Object Formation and Evolution in AGN Disks** **Shanghai & Beijing**
Seminar Talk, Invited by Tsinghua University, Shanghai Observatory, TD Lee Institute etc. May 2023
- **Enhancement of Star Formation in AGN Disks by Radiation Pressure** **New York City**
Oral Presentation, 2nd 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**

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| <i>Chi-sun Yeh Academic Lectures, Tsinghua University</i> | Jun 2020 |
| <ul style="list-style-type: none"> • <u>Formation of Close-in Planets (sub-Neptunes/super-Earths)</u>
<i>Department of Astronomy (DoA) seminar on theoretical astrophysics, Tsinghua University</i> | Beijing
Apr 2020 |
| <ul style="list-style-type: none"> • <u>Galactic Center Microlensing</u>
<i>Report of research project, Moving Universe Group Meeting</i> | Berkeley, California
Dec 2019 |
| <ul style="list-style-type: none"> • <u>Dust Diffusion in Protoplanetary Disks and Formation of super Earths</u>
<i>Report of research project, Formation and Evolution of Planetary System Conference</i> | Urumqi
Jul 2019 |
| <ul style="list-style-type: none"> • <u>Linear Magneto-Rotational Instability</u>
<i>DoA seminar on theoretical astrophysics, Tsinghua University</i> | Beijing
Apr 2019 |

CONFERENCES & WORKSHOPS

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| • Accretion Modified Stars in AGNs, Nanjing | June 2023 |
| • Center of Computational Astrophysics Athena++ Workshop, New York | May 2023 |
| • AGN in Santa Fe: Where are the Objects in AGN Disks? | 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 |

STUDENTS ADVISED

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| <ul style="list-style-type: none"> • Max Qiu (Grade 12, TMS School, Toronto)
ISEF (International Science and Engineering Fair) Project: <i>Enhanced Microlensing in the Galactic Center</i> | Nov 2022 - May 2023 |
| <ul style="list-style-type: none"> • Jeff Ho (Grade 12, Winchester College, Winchester)
S. T. Yau High School Science Fair Project: <i>Structure of AGN Disks Across A Wide Range of Parameter Space</i> | May 2023 - Aug 2023 |

SKILLS AND INTERESTS

Language Abilities:

- Chinese: Mandarin (native), Cantonese
- Japanese
- 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](#)

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

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, Award-winning campus singer, Guest performer on Student Gala
- Selected Vocal Performances: [*My Way*](#), [*Wandering Earth Theme*](#), [*Keep me by your Side \(让我留在你身边\)*](#), [*When we were Young*](#), [*葡萄成熟時*](#), [*This is the Moment*](#), [*Shall We Talk*](#), [*任我行*](#)

Film production:

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