

Yinhao Wu (吴寅昊)

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Education

University of Leicester, Doctor of Philosophy	Leicester, UK
Astronomy, School of Physics and Astronomy	2021.09–
Supervisor: Sergei Nayakshin	
Northwest University, Bachelor of Science	Xi'an, CN
Physics, Department of Physics	2015.09–2019.07

Research Experiences

Department of Astronomy and Steward Observatory, University of Arizona	Tucson, USA
Visiting Student (Dustbusters funded)	2023.01–2023.04
Institute of Astronomy and Astrophysics, Academia Sinica (ASIAA)	Taipei, ROC
Summer Student (Remote, 1 first-author paper published)	2022.07–2022.08
PA7081 (Practical Programming, Python), University of Leicester	Leicester, UK
Teaching Assistant	2021.09–2022.02

References

- **Prof. Sergei Nayakshin**
Professor
School of Physics and Astronomy, University of Leicester
Email: sn85@leicester.ac.uk
3 collaborative papers, 1 ongoing, 1 collaborative ALMA proposal
- **Dr. Min-Kai Lin**
Associate Research Fellow
Academia Sinica Institute of Astronomy and Astrophysics
Email: mklin@asiaa.sinica.edu.tw
2 collaborative papers, 1 ongoing, 1 collaborative ALMA proposal
- **Prof. Douglas N. C. Lin**
Member of American Academy of Arts and Sciences
University of California, Santa Cruz
Email: lin@ucolick.org
1 collaborative papers, 1 ongoing
- **Prof. Xue-Ning Bai**
Professor
Institute for Advanced Study at Tsinghua University
Email: xbai@tsinghua.edu.cn
1 ongoing collaborative paper, 1 collaborative ALMA proposal

Publications

See the full publication list on [ADS](#)

ORCID ID: [0000-0003-3728-8231](#)

Refereed Journal Publications: **Lead Author** (6, include 1 single-author paper)

6. [Asymmetry, Gap Opening and High Accretion Rate on DM Tau: A Hypothesis Based on Interaction of Magnetized Disk Wind with Planet](#)

Yinhao Wu, 2024, **The Astrophysical Journal**, 970, 25

Contributions: **Single-author**, propose this idea, modify code (multi-fluid and MHD wind modules), run 2D Hydro numerical simulation, run radiation transfer calculation, create synthetic maps, and analyze the results.

5. [Observability of substructures in planet-forming disk in \(sub\)cm wavelength with SKA and ngVLA](#)

Yinhao Wu, Shang-Fei Liu, Haochang Jiang & Sergei Nayakshin, 2024, **The Astrophysical Journal**, 965, 2

Contributions: Modify code (multi-fluid module), run 2D Hydro numerical simulation, run radiation transfer calculation, create synthetic maps, and analyze the results.

4. [Dust Dynamics in Hall-affected Protoplanetary Disks. I. Background Drift Hall Instability](#)

Yinhao Wu, Min-Kai Lin, Can Cui, Leonardo Krapp, Yueh-Ning Lee & Andrew N. Youdin, 2024, **The Astrophysical Journal**, 962, 173

Contributions: Derive a system of linear equations, perform numerical calculations, conduct numerical simulation design, and analyze the results.

3. [Chaotic Type I Migration in Turbulent Discs](#)

Yinhao Wu, Yi-Xian Chen & Douglas N. C. Lin, 2024, **Monthly Notices of the Royal Astronomical Society Letters**, 528, 127

Contributions: Modify code (MHD turbulence module), run 2D Hydro numerical simulation and analyze the results.

2. [Distinguishing Magnetized Disc Winds from Turbulent Viscosity through Substructure Morphology in Planet-forming Discs](#)

Yinhao Wu, Yi-Xian Chen, Haochang Jiang, Ruobing Dong, Enrique Maciás, Min-Kai Lin, Giovanni Rosotti & Vardan Elbakyan, 2023, **Monthly Notices of the Royal Astronomical Society**, 523, 2630

Contributions: Propose this idea, modify code (MHD wind module), run 2D Hydro numerical simulation, run radiation transfer calculation, create synthetic maps, analyze the results, and find collaborators.

1. [Using planet migration and dust drift to weigh protoplanetary discs](#)

Yinhao Wu, Clément Baruteau & Sergei Nayakshin, 2023, **Monthly Notices of the Royal Astronomical Society**, 523, 4869

Contributions: Modify code (multi-fluid module), run 2D Hydro numerical simulation, run radiation transfer calculation, create synthetic maps, and analyze the results.

Refereed Journal Publications: **Second-Author** (1)

1. *Gap Opening by Planets in Disks with MHD Winds*

Vardan Elbakyan, **Yinhao Wu**, Sergei Nayakshin & Giovanni Rosotti, 2022, **Monthly Notices of the Royal Astronomical Society**, 515, 3113

Contributions: Modify code (MHD wind module), run 2D Hydro numerical simulation, and analyze the results.

Ongoing: **First-Author** (5)

5. *How Planet Migration in Windy-disc*

Yinhao Wu, & Yi-Xian Chen, 2024,

Contributions: Propose this idea, modify code (MHD wind module), run 2D Hydro numerical simulation, and analyze the results.

4. *Multi-planet Migration in Turbulent Disc (TBD)*

Yinhao Wu, Yi-Xian Chen, Ya-Ping Li & Douglas N. C. Lin, 2024,

Contributions: Propose this idea, modify code (MHD turbulence module), run 2D Hydro numerical simulation and analyze the results.

3. *Dust Dynamics in Hall-effected Protoplanetary Disks. II. Three-dimensional Global MHD Simulations*

Yinhao Wu, Leonardo Krapp, Min-Kai Lin & et al. 2024,

Contributions: Propose this idea, run 3D MHD numerical simulation, and analyze the results.

2. *Three-dimensional Global Simulations of Planet-Disk Interaction with a Magnetized Disk Wind in Hall-effected Disk*

Yinhao Wu, Yuhiko Aoyama, Xue-Ning Bai, 2024,

Contributions: Modify code (MHD wind module with hall effect), run 3D MHD numerical simulation, and analyze the results.

1. *Use Planet Migration and Thermal Instability to Study Outbursts*

Yinhao Wu, Sergei Nayakshin & et al. 2024,

Contributions: Modify code (thermal instability module in adiabatic system), run 2D adiabatic numerical simulation, and analyze the results.

Approved Observing Proposals

As **PI**:

1. **2024: ALMA Cycle 11**, 2024.1.00935.S, **16.1h**, “Uncovering hidden dense clumps in a millimeter ring”

Awards (selected)

- Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP) 2023.07-2024.07
- University of Leicester Centenary PGR Research Support Funds 2022

Research Interests

Protoplanetary Disks, Planet-disk Interaction, Planet Migration, Dust Dynamics, Disk Substructures, Dynamics in AGN Disks, Non-ideal MHD effect in Disks

Skills

Code: ZEUS-MP, ATHENA++, FARGO3D, FARGO-ADSG, FARGO-CPT, RADMC-3D, OpTool

Software: VisIt, CASA, Mathematica

Computer Language: Fortran, C language, C++, Python

Language: Chinese (native), English (fluent), Japanese (beginner)

Oral Presentations

Invited Colloquia and Seminars (13)

- [ECOGAL](#) Seminar,
Université Paris-Saclay, Paris, FR (Online) 2024.10
- [National Astronomical Observatory of Japan \(NAOJ\) Seminar](#),
NAOJ, Tokyo, JP 2024.09
- *Institute for Theory and Computation (ITC) Special Seminar*,
The Center for Astrophysics | Harvard & Smithsonian (CfA), Harvard University, Cambridge, USA 2024.06
- *Astro Coffee*,
Princeton University, Princeton, USA 2024.06
- *Lunch Talk*,
Department of Astronomy, University of Wisconsin-Madison (UW-M), Madison, USA 2024.05
- *Shanghai Astronomical Observatory (SHAO) Earth 2.0 (ET) Science Seminar*,
SHAO, Shanghai, CN (Online) 2024.03
- *THU Joint Planet Group Meeting*,
THU, Beijing, CN (Online) 2024.01
- *Queen Mary University of London (QMUL) Planetary Seminar*,
QMUL, London, UK 2023.11
- *Shanghai Astronomical Observatory (SHAO) Astrophysics Seminar*,
SHAO, Shanghai, CN 2023.09
- [Tsung-Dao Lee Institute \(TDLI\) Astronomy and Astrophysics Seminar](#),
TDLI, Shanghai, CN 2023.09
- *Planetary Science Seminar, SYSU*,
SYSU, Zhuhai, CN 2023.08
- *Forum for Graduate Students at School of Physics and Astronomy, Sun Yat-Sen University (SYSU)*,
SYSU, Zhuhai, CN 2023.08
- *Tsinghua University (THU) Joint Planet Group Meeting*,
THU, Beijing, CN (Online) 2023.05
- *National Center for Theoretical Sciences (NCTS) Astrophysics Lunch Seminar*,
ASIAA & NCTS, Taipei, ROC 2023.04
- [Princeton Thunch](#),
Princeton University, Princeton, USA (Online) 2022.10

Conferences Oral Presentations (10)

- [European Astronomical Society \(EAS\) Annual Meeting 2024](#) (×2),
Padova, Italy 2024.07

– TCAN Disk Hydro & Planet Formation , University of Arizona, Tucson, USA (Online)	2023.11
– The National Astronomy Meeting 2023 (NAM2023) , Cardiff University, Cardiff, UK	2023.07
– 2nd Midlands Discs Meeting , University of Leicester, Leicester UK	2023.06
– Doctoral College Researcher Conference , University of Leicester, Leicester, UK (Online)	2023.04
– The 9th East Asian Numerical Astrophysics Meeting (EANAM9) , Tenbusu Naha, JP (Online)	2022.09
– Planet and binary formation in gravitationally unstable protoplanetary discs in the high-resolution era , University of Leicester, Leicester, UK	2022.09
– NCTS-ASIAA Workshop: Stars, Planets, and Formosa , ASIAA, Taipei, ROC (Online)	2022.08
– 1st Midlands Discs Meeting , University of Warwick, Warwick, UK	2022.04
Contributed Seminar or Group Meeting (4)	
– Steward Observatory Planet Formation Group Meeting , University of Arizona, Tucson, USA	2023.03
– Flatiron Institute Center for Computational Astrophysics (CCA) Planet Formation Group Meeting , CCA, New York, USA	2023.03
– Lunar and Planetary Laboratory (LPL) Planet Formation Group Meeting , LPL, University of Arizona, Tucson, USA	2023.03
– Steward Observatory Planet Formation Group Meeting , Steward Observatory, University of Arizona, Tucson, USA	2023.02
Conferences Poster Presentations (5)	
– New Heights in Planet Formation , Garching, Germany	2024.07
– EAS Annual Meeting 2024 , Padova, Italy	2024.07
– The 2023 Emerging Researchers in Exoplanet Science Symposium (ERES VIII, Heising-Simons Foundation funded) , Yale University, New Haven, USA	2023.06
– Doctoral College Researcher Conference , University of Leicester, Leicester, UK	2023.04
– Protostars and Planets VII (PP7) , Kyoto, JP	2023.04



Professional Activities and Services

Referee for

– <i>ApJS</i>	2023.10–
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Member of

- *European Cooperation in Science and Technology (COST) Action (CA22133) - The birth of solar systems (PLANETS), working groups 3 (Planet formation theory confronts observations), 5 (Dissemination, public engagement, and outreach) and 7 (Towards the first database on planet-forming discs).* 2023.10–

Conference Local Organizing Committee (2)

- *Planet and Binary Formation in Gravitationally Unstable Protoplanetary Discs in the High-Resolution Era.* 2022.09
- *Disc Fragmentation Workshop.* 2022.01

Seminar Organizer (2)

- *COST Action PLANETS WG3 Science Seminar Series (WG3-SSS), more than 150 members from EU, UK, USA, East Asia and Australia* 2024.04–
- *Astrophysics Seminar, School of Physics and Astronomy, University of Leicester* 2022.06–2023.06

✨ Public Outreach Activities (selected)

I have been participated in **Three Minute Wonder** - East Midlands Branch. 2022.03

I am helping the famous volunteer Science Program **Galaxy Zoo** translate the website **Radio Galaxy Zoo: LOFAR** into Chinese and joined their volunteer team. 2021.10–

I have translated **John Archibald Wheeler: A Biographical Memoir** to Chinese under the authorization of the original author Kip Thorne. 2019.02

I am committed to popular science in the field of Astrophysics in the Chinese knowledge forum **Zhihu**, with more than 40 thousand fans and a total reading of more than 5 million. 2017.09–