

# Zihao Lin

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## Summary

I am a Master student at the School of Astronomy and Space Science, Nanjing University. My research focuses on ringdown analysis and gravitational lensing, and I am also exploring the application of machine learning and statistical methods to gravitational wave data.

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## Scientific Interests

Numerical relativity, ringdown analysis, black hole quasi-normal modes, gravitational lensing.

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## Education

2023–2026 **Nanjing University**, Master in Astrophysics

Advised by **Prof. Jianhua He**

2019–2023 **Nanjing University**, B.A. in Astrophysics, GPA: 4.51/5.0, Rank: 4/53

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## Research Experience

Bachelor I contributed to extending the GalCEM code from a one-zone model to a multi-zone model under the supervision of **Eda Gjergo**. This code simulates galactic chemical evolution. By incorporating varying infall times, I simulated the Milky Way using a multi-zone framework, and my results showed strong agreement with Gaia data.

Master I am currently investigating quasi-normal modes and gravitational lensing by isolated black holes. I developed Python code using the Lax-Wendroff method to solve the Regge-Wheeler equation. My results were compared to GWSim, a C++ code developed by my supervisor, **Prof. Jianhua He**. The comparison between 1D and 3D results showed excellent consistency, validating the accuracy of the 3D code. I plan to further explore gravitational lensing using this framework. This results in a paper under review in prl and I am the co-first author.

Summer internship I am working with **Justin Janquart** on further developing Jim, a jax based parameter estimation of gravitational waves.

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## Honors

December 2022 **First Class Academic Scholarship**, *For Excellence in Courses*, Nanjing University

November 2022 **Excellence Award, Nanjing University Undergraduate Scholarship for Basic Disciplines**, *For being member of the fundamental sciences*, Nanjing University

December 2021 **Wanglaoji Scholarship**, *High scholarship from an enterprise*, Nanjing University

December 2020 **Second Class Academic Scholarship**, *For Excellence in Courses*, Nanjing University

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## Outreach

I am a member of the astronomy outreach group at Jinling Primary School, where I introduce students to basic concepts of astronomy and guide them in operating small telescopes.

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## Contact

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## References

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