

# Ryotaro Chiba

PHD STUDENT AT NAOJ / SOKENDAI

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## Research Interests

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Supernovae, circumstellar material, evolution of massive stars

## Education

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### Ph.D., Astronomy

Astronomical Science Program, Graduate University of Advanced Studies, SOKENDAI

Tokyo, Japan

2024-03 – present

- Topic: Interaction between supernovae and their surrounding environments
- Advisors: Takashi J. Moriya, Nozomu Tominaga, Koh Takahashi

### B.Sc., Astronomy

Department of Astronomy, University of Tokyo

Tokyo, Japan

2020-04 – 2024-03

- Topic: Theoretical modelling of oxygen shell flash in massive stars
- Advisor: Toshikazu Shigeyama

## Grants and Fellowships

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### Astronomical Society of Japan, Hayakawa Satio Fund (travel grant)

JPY 200,000

2025-07

### SOKENDAI Astronomical Science Program, Overseas Travel Grant

JPY 300,000

2025-05

### NAOJ Junior Fellow

JPY 9,000,000

2024-04 – 2029-03

### Nakamura Sekizen Foundation Scholarship

JPY 3,600,000

2023-04 – 2029-03

### Mitsubishi UFJ Trust Scholarship

JPY 1,260,000

2021-04 – 2024-03

## Honours and Awards

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### Academic Encouragement Award

School of Science, University of Tokyo

Tokyo, Japan

2024-03

- Awarded to top students in the department

### Gold Medal

50th International Physics Olympiad

Tel Aviv, Israel

2019-08

- Awarded to top 8% students in the competition

## Research Experience

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### Research stay

University of Chile

Santiago, Chile

2025-01

- Additionally visited ESO Vitacura Office, Cerro Calán National Observatory, Andrés Bello National University, and Diego Portales University for discussions

- Host: Francisco Förster Burón

## Summer Student Internship

National Astronomical Observatory of Japan

*Tokyo, Japan*

2023-08

- Worked on fully relativistic Monte Carlo radiative transfer code for gamma ray bursts
- Host: Nozomu Tominaga

## Publications

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Upcoming

### Hydrodynamic Modelling of Early Peaks in Type Ibc Supernovae with Shock Cooling Emission from Circumstellar Matter

Ryotaro Chiba, Takashi J. Moriya

2025

- Submitted to Monthly Notices of the Royal Astronomical Society
- <https://arxiv.org/abs/2504.06445>

### A Thermonuclear Supernova Interacting with Hydrogen- and Helium-deficient Circumstellar Material — SN 2020aeuh as a SN Ia-CSM-C/O?

Konstantinos Tsalapatas, Jesper Sollerman, Ryotaro Chiba, et al.

2025

- Submitted to Astronomy & Astrophysics
- <https://arxiv.org/abs/2507.08532>

Published — Lead Author

### Characterisation of Supernovae Interacting with Dense Circumstellar Matter with a Flat Density Profile

Ryotaro Chiba, Takashi J. Moriya

2024

- The Astrophysical Journal, 973, 14
- <https://arxiv.org/abs/2407.07244>

## Selected Conference Presentations

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Contributed Talks

### Binary Stars in a New Era

*Lijiang, China*

(Upcoming) Early Peaks in Type Ibc Supernovae: Implications for Late-Stage Binary Mass Transfer

2025

### One Hundred Years of Supernovae

*Stockholm, Sweden*

(Upcoming) Exploring pre-supernova mass loss with modelling of double-peaked Type Ibc supernovae

2025

### Transients From Space

*Baltimore, USA*

Exploring pre-supernova mass loss with modelling of double-peaked type Ibc SNe

2025

### The Progenitors of Supernovae and their Explosions

*Dali, China*

Characterisation of Supernovae Interacting with Circumstellar Matter with a Flat Density Profile

2024

Posters

### European Astronomical Society Annual Meeting 2025

*Cork, Ireland*

Hydrodynamic Modelling of Early Peaks in Type Ibc Supernovae with Shock Cooling Emission from Circumstellar Matter

2025

## Outreach

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### Member of the organising committee

Japan Astronomy Olympiad

2022-03 – present

## Student member of the organising committee

Japan Physics Olympiad

2020-03 – present

## Skills

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### Languages

Japanese (Native), English (Proficient), German (Intermediate), Chinese (Intermediate), Spanish (Elementary), French (Elementary), Russian (Beginner), Korean (Beginner)

### Programming Languages

Python, C++, Fortran