

Ryotaro Chiba

PHD STUDENT AT NAOJ / SOKENDAI

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Research Interests

Supernovae, circumstellar material, evolution of massive stars

Education

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

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

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

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

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

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

Member of the organising committee

Japan Astronomy Olympiad

2022-03 – present

Student member of the organising committee

Japan Physics Olympiad

2020-03 – present

Skills

Languages

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

Programming Languages

Python, C++, Fortran