Ryotaro **Chiba**

PhD student at NAOJ / SOKENDAI

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https://ectoplsm.github.io ryotaro.chiba@grad.nao.ac.jp 0009-0003-4594-3715 ectoplsm

Research Interests

Supernovae, circumstellar material, evolution of massive stars

Education

Ph.D., Astronomy

Tokyo, Japan

Astronomical Science Program, Graduate University of Advanced Studies, SOKENDAI

2024-03 – present

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

B.Sc., Astronomy

Tokyo, Japan

Department of Astronomy, University of Tokyo

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

Tokyo, Japan

School of Science, University of Tokyo

2024-03

- Awarded to top students in the department

Gold Medal

Tel Aviv, Israel

50th International Physics Olympiad

2019-08

- Awarded to top 8% students in the competition

Research Experience

Research stay

Santiago, Chile

University of 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 *Tokyo, Japan*
National Astronomical Observatory of Japan *2023-08*

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

Publications

Upcoming

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

Hydrodynamic Modelling of Early Peaks in Type Ibc Supernovae with Shock Cooling Emission from Circumstellar Matter
Ryotaro Chiba, Takashi J. Moriya *2025*

- Monthly Notices of the Royal Astronomical Society, 542, 2353
- https://arxiv.org/abs/2504.06445

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*
Early Peaks in Type Ibc Supernovae: Implications for Late-Stage Binary Mass Transfer *2025*

One Hundred Years of Supernovae *Stockholm, Sweden*
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