

Ryosuke Hirai

Curriculum Vitae

Personal Information

Name Ryosuke Hirai (平井 遼介)
Nationality Japanese
Gender Male
Date of Birth 12th August, 1989
Email ryosuke.hirai@monash.edu

Research Interests

2012– Binary stars and supernovae
2015– Efficient numerical schemes for difference equations
2018– Stellar mergers

Education

2014–2017 **Doctor of Science**, *Waseda University*, Advanced Research Institute of Science and Engineering.
2012–2014 **Master of Science**, *Waseda University*, Advanced Research Institute of Science and Engineering.
2008–2012 **Bachelor of Engineering**, *Waseda University*, School of Advanced Science and Engineering.

Research Experience

2019.12– **Research Fellow**, at *School of Physics and Astronomy*, Monash University.
2017–2019 **JSPS Overseas Research Fellow**, at *Department of Physics*, University of Oxford.
2017.4–10 **JSPS Research Fellow (PD)**, at *Advanced Research Institute of Science and Engineering*, Waseda University.
2016–2017 **JSPS Research Fellow (DC2)**, at *Advanced Research Institute of Science and Engineering*, Waseda University.

Grants

2018 **Hayakawa Satio Fund**, **Astronomical Society of Japan**, ~210000 JPY.
2016–2017 **JSPS Research Fellow (DC2)**, **Fellowship + Grant**, 1200000+1100000 JPY.

2015 **Research Grant for Young Scientists, Early Bird Program from Waseda Research Institute for Science and Engineering, 400000 JPY.**

Languages

Japanese **Mothertongue**

English **Fluent**

Spent 8.5 years of childhood in England

Publications

First Author

- [7] **Formation pathway for lonely stripped-envelope supernova progenitors: implications for Cassiopeia A**
Ryosuke Hirai, Toshiki Sato, Philipp Podsiadlowski, Alejandro Vigna-Gómez, Ilya Mandel
Monthly Notices of the Royal Astronomical Society, Volume 499, Issue 1, pp.1154-1171 (2020)
- [6] **Comprehensive study of ejecta-companion interaction for core-collapse supernovae in massive binaries**
Ryosuke Hirai, Philipp Podsiadlowski, Shoichi Yamada
The Astrophysical Journal, Volume 864, Issue 2, article id. 119, 17 pp. (2018)
- [5] **The Origin of the Possible Massive Black Hole in the Progenitor System of iPTF13bvn**
Ryosuke Hirai
Monthly Notices of the Royal Astronomical Society: Letters, Volume 469, Issue 1, p.L94-L98 (2017)
- [4] **Formation Scenario of the Progenitor of iPTF13bvn Revisited**
Ryosuke Hirai
Monthly Notices of the Royal Astronomical Society, Volume 466, Issue 4, p.3775-3783 (2017)
- [3] **Hyperbolic Self-Gravity Solver for Large Scale Hydrodynamical Simulations**
Ryosuke Hirai, Hiroki Nagakura, Hirotada Okawa, Kotaro Fujisawa
Physical Review D, Volume 93, Issue 8, article id.083006 (2016)
- [2] **Possible Signatures of Ejecta-Companion Interaction in iPTF 13bvn**
Ryosuke Hirai, Shoichi Yamada
The Astrophysical Journal, Volume 805, Issue 2, article id. 170, 7 pp. (2015)
- [1] **The Outcome of Supernovae in Massive Binaries; Removed Mass, and its Separation Dependence**
Ryosuke Hirai, Hidetomo Sawai, Shoichi Yamada
The Astrophysical Journal, Volume 792, Issue 1, article id. 66, 15 pp. (2014)

Co-Author

- [7] **Neutron Star Extreme Matter Observatory: A kilohertz-band gravitational-wave detector in the global network**
Ackley et al. (including [Ryosuke Hirai](#))
submitted
- [6] **The sensitivity of presupernova neutrinos to stellar evolution models**
Chinami Kato, [Ryosuke Hirai](#), Hiroki Nagakura
Monthly Notices of the Royal Astronomical Society, Volume 496, Issue 3, pp.3961-3972 (2020)
- [5] **A Subsolar Metallicity Progenitor for Cassiopeia A, the Remnant of a Type IIb Supernova**
Toshiki Sato, Takashi Yoshida, Hideyuki Umeda, Shigehiro Nagataki, Masaomi Ono, Keiichi Maeda, [Ryosuke Hirai](#), John P. Hughes, Brian J. Williams, Yoshitomo Maeda
The Astrophysical Journal, Volume 893, Issue 1, id.49, 9 pp. (2020)
- [4] **Origins of Type Ibn SNe 2006jc/2015G in interacting binaries and implications for pre-SN eruptions**
Ning-Chen Sun, Jusytn R. Maund, [Ryosuke Hirai](#), Paul A. Crowther, Philipp Podsiadlowski
Monthly Notices of the Royal Astronomical Society, Volume 491, Issue 4, p.6000-6019 (2020)
- [3] **Hydrodynamical simulations and similarity relations for eruptive mass loss from massive stars**
Stanley P. Owocki, [Ryosuke Hirai](#), Philipp Podsiadlowski, Fabian R. N. Schneider
Monthly Notices of the Royal Astronomical Society, Volume 485, Issue 1, p.988-1000 (2019)
- [2] **The W4 method: a new multi-dimensional root-finding scheme for nonlinear systems of equations**
Hirotada Okawa, Kotaro Fujisawa, Yu Yamamoto, [Ryosuke Hirai](#), Nobutoshi Yasutake, Hiroki Nagakura, Shoichi Yamada
arXiv:1809.04495
- [1] **Formation pathway of Population III coalescing binary black holes through stable mass transfer**
Kohei Inayoshi, [Ryosuke Hirai](#), Tomoya Kinugawa, Kenta Hotokezaka
Monthly Notices of the Royal Astronomical Society, Volume 468, Issue 4, p.5020-5032 (2017)

Other Articles

- [1] **水素欠乏超新星の親星の起源(The Origin of the Progenitors of Stripped-Envelope Supernovae)**
平井 遼介 ([Ryosuke Hirai](#))
天文月報(*The Astronomical Herald*), Volume 111, Issue 9, p.580-588 (2018)