

Taeho Ryu

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CONTACT INFORMATION	The Max-Planck Institute for Astrophysics, Karl-Schwarzschild-Str. 1 85748, Garching, Germany	<i>E-mail:</i> tryu@mpa-garching.mpg.de <i>Phone:</i> +1 5515740406, +49 1743130001 <i>Citizenship :</i> Korean citizen U.S. legal permanent resident
RESEARCH	Primary interests: time domain astronomy, multi-messenger transients, tidal disruption events, gravitational waves, formation of runaway/hypervelocity stars, supermassive black hole binaries, formation and interaction of black holes in the early universe - AGN & high-mass X-ray binaries, dynamics of stellar clusters, exoplanets. Methods: relativistic and Newtonian magnetohydrodynamics simulation, N -body simulations, time-dependent Fokker-Planck integrator, stellar evolution simulation	
ACADEMIC APPOINTMENTS	The University of Colorado, Boulder, USA 2025– Assistant Professor	
	JILA, the University of Colorado, Boulder, USA 2025– Associate JILA fellow	
	The Max-Planck Institute for Astrophysics - MPA, Germany 2021– present MPA prize fellow	
	Johns Hopkins University - JHU, USA 2018 – 2021 Postdoctoral research fellow	
	Korea Institute for Advanced Study - KIAS, South Korea 2011 – 2012 Research assistant to Prof. Kimyeong Lee (Department of Physics)	
EDUCATION	Stony Brook University - SBU, USA 2012 – 2018 Ph.D., Physics, 2018 (Advisor: Prof. Rosalba Perna) M.A., Physics, 2014	
	Seoul National University - SNU, South Korea 2005 – 2011 B.S. in Chemistry & Physics (Double-major/Cum Laude) Teaching practicum in Chemistry ★2 years of mandatory military service	
HONORS, AWARDS AND AFFILIATION	Dresden Prize (for outstanding theoretical thesis), SBU 05/2018	
	Peter B. Kahn Fellowship , SBU 05/2016	
	SNUANY Scholarship Award , SNU Alumni Association of Greater New York 11/2014	
	SNUANY Scholarship Award , SNU Alumni Association of Greater New York 12/2013	
	Benjamin Lee Award , SBU 05/2013	
	SNU Outstanding Student award (Twice winner), SNU 2009 - 2010	
	National Scholarship for Science & Engineering (Thrice winner) 2009 - 2010	
	Scholarship for Superior Academic Performance (Five-time winner),SNU 2005 - 2007	

SUPERCOMPUTING
ALLOCATIONS

Principal Investigator: *HLRS* (Stuttgart tier 1), project name : *Global Relativistic Magneto-hydrodynamics Simulations of the Long-term Evolution of Tidal Debris in Tidal Disruption Events of Stars*, amount : **55M** cpu hours on Hawk

★ annual report selected for presentation with publication in the proceedings of 2023 HLRS Review workshop.

Principal Investigator (Co-PI: Volker Springel): *NHR@FAU* (tier 2), project name : *Transient formation in three-body encounters between stars and black holes*, amount : **3.6M** cpu hours on Fritz

Project Manager (PI: Selma de Mink): *NHR@FAU* (tier 2), project name : *3D hydrodynamics simulations of mass transfer in interacting binaries*, amount : **3.4M** cpu hours on Fritz

INVITED TALKS

GSSI Special Seminar , the Gran Sasso Science Institute, Italy	11/2024
IMPRS Symposium , Germany	11/2024
SCEECS Seminar , USA	11/2024
GW/BH Seminar , University of Zurich, Switzerland	10/2024
HEACOSS 2024 , Armenia	10/2024
Tea Seminar , University of Heidelberg, Germany	7/2024
Institute Seminar , MPA, Germany	7/2024
Seventeenth Marcel Grossmann meeting , Italy	7/2024
Department Colloquium , the University of Oklahoma, USA	3/2024
Department Colloquium , the University of Colorado, Boulder, USA	2/2024
Department Colloquium , the University of California, San Diego, USA	2/2024
Department Colloquium , the Institute for Astronomy at the University at Hawaii, USA	2/2024
Department Seminar , the Univeristy of the Balearic Islands, Spain	12/2023
Astronomy Seminar , the Univeristy of Nova Gorica, Slovenia	11/2023
Department Colloquium , Kyung Hee University, Korea	11/2023
Plasma Physics Seminar , Max Planck Institute for Plasma Physics, Germany	11/2023
Department Colloquium , SNU, Korea	10/2023
Colloquium , Korea Astronomy & Space Science Institute, Korea	10/2023
Lagrange Seminar , Lagrange Laboratoire, France	09/2023
Astronomy Seminar , Max-Planck Institute for Gravitational Physics(AEI), Germany	09/2023
Special Seminar , New York University, USA	09/2023
Astronomy Seminar , Columbia University, USA	09/2023
Astronomy Seminar , Stony Brook University, USA	09/2023
Special Seminar , Northwestern University(CIERA), USA	08/2023
MPA/Kavli Summer Program Seminar , MPA, Germany	06/2023

	HUJI Astrophysics Seminar , HUJI, Isreal	03/2023
	2022 MIAPP Conference “The Fundamental Role of Stellar Multiplicity in Stellar Dynamics and Evolution” , MIAPP, Germany	11/2022
	Department Colloquium , University of Tübingen, Germany	07/2022
	Black Hole Workshop , Niels Bohr Institute, Denmark	06/2022
	MPA Seminar , MPA, Germany	10/2021
	Astro UdeC Seminar , the Universidad de Concepción, Chile	04/2021
	CTC Seminar , University of Maryland, USA	06/2019
	Wine& Cheese Seminar , JHU, USA	04/2019
	Department Seminar , SBU, USA	04/2018
	Numerical Scattering Workshop , Flatiron Institute, USA	12/2017
	Black Hole Network Workshop , Flatiron Institute, USA	12/2016
	MODEST-16 NYC Gas and Gravitational Dynamics , USA	09/2016
	Frontier Research in Astrophysics – II , Italy	05/2016
	Astronomy Seminar , Columbia University, USA	05/2016
CONTRIBUTED TALKS	MODEST24 , Nicolaus Copernicus Astronomical Center, Poland	08/2024
	Korean Astronomical Society Fall Meeting , KAS, Korea	10/2023
	Two in a Million , ESO, Germany	09/2023
	MODEST23 , Northwestern University, USA	08/2023
	European Astronomical Society Annual Meeting , Krakow, Poland	07/2023
	The Black Holes and Gravitational Waves Munich Day , Germany	05/2023
	Aspen Workshop “Extreme Black Holes” , USA	03/2023
	WE Heraeus-EAS Early Career Researchers in Astr. Workshop , Germany	03/2023
	XMM-Newton Workshop 2022 , Spain	06/2022
	Growing Black Holes: Accretion and Mergers , Nepal	05/2022
	SESTAS Meeting , MPA	10/2021
	HotSci@JHU/STScI , STScI	08/2021
	European Astronomical Society Annual Meeting , Leiden	07/2021
	Tidal Disruptions in Kyoto: Confronting Theory with Observations , Kyoto University, Japan	01/2020
POSTERS	MODEST24 , Nicolaus Copernicus Astronomical Center, Poland	08/2024
	Distorted Astrophysical disks , University of Cambridge	05/2021
	The 7th Annual Johns Hopkins Postdoctoral Conference , JHU	04/2021

STUDENT SUPERVISION	<p>Ian Johnson 2024-present (Master's student, co-supervision with Prof. Rosalba Perna)</p> <p style="padding-left: 2em;">Institute: Stony Brook University, USA Project: Hydrodynamics simulations of tidal disruption encores Method: Hydrodynamics modeling with Arepo</p> <p>Elias Mamuzic 2023-present (Master's student, co-supervision with Prof. Sherry Suyu)</p> <p style="padding-left: 2em;">Institute: Technical University of Munich, Germany Project: Gravitational Lensing of Tidal Disruption Events Method: Monte-Carlo simulations for gravitational lensing with temperature- dependent luminosity models</p> <p>Alonso Herrera 2022-2024 (Master's student, co-supervision with Prof. Nathan Leigh) → Master's degree awarded</p> <p style="padding-left: 2em;">Institute: Universidad de Concepción, Chile Project: Identification of runaway stars using Gaia data Method: Analytic estimates for ejection velocity, analysis of Gaia data</p> <p>Magdalena Andrea Vilaxa Campos 2022-2023 (Master's student, co-supervision with Prof. Nathan Leigh)</p> <p style="padding-left: 2em;">Institute: Universidad de Concepción, Chile Project: Stream penetration into mass accretor in Roche-lobe overflow in interacting binaries Method: Analytic estimates and hydrodynamics simulations</p> <p>Kaitlyn Szekerczes 2022-2023 (PhD student, co-supervision with Prof. Sherry Suyu)</p> <p style="padding-left: 2em;">Institute: formerly a fulbright fellow at MPA → PhD student at Pennsylvania State University Project: Estimate of strongly-lensed tidal disruption event detection rate by LSST Method: Monte-Carlo simulations for gravitational lensing</p> <p>Pavan Vynatheya 2022-2024 (PhD student, co-supervision with Dr. Rüdiger Pakmor, Prof. Selma de Mink)</p> <p style="padding-left: 2em;">Institute: Formerly a PhD student at MPA → Prize fellow at CITA Project: Remnant properties of partially disrupted stars by stellar-mass black holes Method: Stellar evolution and hydrodynamics simulations</p>
GRANTS	<p>German-Israel Foundation: (CoI) Mass transfer hydrodynamics in binary stars. Dates: Award Amount: €279,600</p>
CERTIFICATION	<p>Korean National Teacher Certification 2011</p>
TEACHING EXPERIENCE	<p>Lecturer, MPA, Germany 08/2017 Delievered a lecture for hydrodynamics at the MPA/Kavli Summer Program</p>

	Lecturer , MPA, Germany	06/2017
	Delievered lectures for hydrodynamics and led tutorial sessions at a one-day workshop for hydrodynamics simulations at MPA	
	Guest lecturer , AST200 Course by Prof. Jin Koda, SBU, USA	02/2017
	Delivered a lecture for black holes to undergraduate students	
	Teaching Assistant , Department of Physics and Astronomy, SBU, USA	2012-2014
	Prepared physics lab experiments and assisted students in conducting experiments	
	Teacher , Seoul National University Girls' Middle School, South Korea	Spring 2011
	Taught middle-school students chemistry as part of the teaching practicum course	
	Teaching Assistant , Language Education Institute, SNU, South Korea	Spring 2011
	Volunteer work to assist students who are hearing impaired in their coursework.	
	Lecturer , Central Library, SNU, South Korea	Spring 2009
	Voluneteer work to enhance librarians' grasp of basic scientific concepts in chemistry and physics	
	Lecturer , Hansung high school, South Korea	Spring 2009
	Volunteer work to teach mathematics for high-school students	
PROFESSIONAL SERVICE	Referee for <i>Monthly Notices of the Royal Astronomical Society</i> , <i>The Astrophysical Journal</i> , <i>Publications of the Astronomical Society of the Pacific</i>	
	NASA (2023), member of review panel	
	IMPRS (2023), member of PhD application review panel	
	NSF (2024), member of review panel	
PRESS RELEASE	Close Encounters of stars with the black hole binaries kind	2/2023
	- Astrobites: https://astrobites.org/2023/02/02/close-encounters-of-stars-with-the-black-hole-binaries-kind	
	Supercomputer Simulations Test Star-destroying Black Holes	11/2021
	- Making a movie in collaboration with NASA for the annual event "Black Hole Friday"	
	- Official webpage: https://svs.gsfc.nasa.gov/14000	
	- ~0.3M views on YouTube in less than a week	
	(https://www.youtube.com/watch?v=ALnlZcRoQDY&t=23s)	
	- Articles in public science media: Phys.org, Sciencealert.com, the Jerusalem Post, SciTechDaily and so on.	
	The NEW PHYSICS of Black Hole Star Capture — Extreme Tidal Disruption Events - PBS Space	11/2021
	- ~0.35M views on YouTube in two weeks	
	(https://youtu.be/x72uFHh3oek?si=Z74ZWDC0JeqxbrHm)	
SCIENTIFIC OUTREACH EXPERIENCE	Open Day , MPA	10/2024
	Preparation and execution of a session rocket launching and public lecture about black holes.	
	Girls' day , MPA	04/2023

Preparation and execution of one of the five sessions where a group of high-school female students complete a given scientific task.

SEDS Celestia, BITS Pilani 01/2023
Invited public lecture about black holes and tidal disruption events

Member of the MPA Planetarium Team 04/2022 - present
Present a planetarium show, public science lecture or talk to students visiting MPA

The Johns Hopkins Korean Graduate Student Association, JHU 09/2019
Invited public talk for Networking night (annual event)

LEADERSHIP
EXPERIENCE

Local Organizer of LISA AstroWG meeting, MPA 11/2024
more than 100 participants
Role: Local organizer and social media coordinator

Organizer of AREPO tutorial workshop, MPA 06/2023
Role: Organize and conduct 1-day AREPO tutorial workshop (20 participants) for stellar astrophysics application of AREPO, consisting of lectures for the introduction to hydrodynamics simulations and exercise

Seminar organizer, the Stellar Department at MPA 09/2021 - 09/2022
Role: invite speakers (typically two speakers for each week), schedule seminars and chair the sessions for talks and discussions (along with two other organizers)

Department of Chemistry, SNU, South Korea 2005 - 2006
Department Activities Representative and Organizer
(Student competitions, membership training, freshmen welcoming, etcetera)

SNU Campus Life and Culture Center, SNU, South Korea 2010 - 2011
Mentor-team Manager in SNU Compliance/Mentoring Program
Elected Leader (20 members, My team chosen Best Team of the Year)

COMPUTATIONAL
EXPERIENCE

Computing Skills: Fortran, C/C++, Python

Code: code-testing of multi-domain infrastructure PATCHWORKMHD, usage of GRMHD code HARM3D, Moving-mesh magnetohydrodynamics code AREPO (<https://arepo-code.org/>), Newtonian AMR hydrodynamics code CASTRO (<https://amrex-astro.github.io/Castro/>)

Analysis: Python, Matplotlib, Paraview, Mathematica

High Performance computing: USA (Frontera, Stampede, Rockfish, Seawulf), Germany (Hawk hls, SuperMUC Leibniz, Cobra, Raven, Freya)

AFFILIATION

Junior Member of the International Astronomical Union 06/2022 - present

Member of LISA consortium 11/2022 - present

Member of the Korean Science-Engineering Association 09/2014 - present

NON-SCIENTIFIC
OUTREACH
EXPERIENCE

SNU Obstacle Person Support Center, SNU Spring 2009
Assistant to a hearing-impaired student, and provider of study aid

Kyujanggak Institute for Korean Studies, SNU

Spring 2011

Docent

Program: Improving public understanding of Documentary Heritage of Chosun Dynasty

Museum of Art, SNU

Spring 2011

Docent

Program: Improving public understanding of interactive media art in the Garden of Forking Paths

MILITARY SERVICE **Military Required Service, South Korea**

2007 – 2009

Honorably Discharged as a Sergeant

Served inter alia in Food/Water Inspectorate (Laboratory) plus assist. mgmt.

References

Professor Rosalba Perna (Associate Department Chair)
Department of Physics and Astronomy, Stony Brook University
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Professor Tsvi Piran (Schwartzman Chair for Theoretical Physics)
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Email: tsvi.piran@mail.huji.ac.il

Publications

ads link: <https://ui.adsabs.harvard.edu/user/libraries/mbdD-GljSZ-nQ6a7LbzzQw>

Books

45. **Ryu, T.**, Wever, T., *Tidal Disruption Events*, To appear in Chapter 5 in the review book *Black Holes in the Era of Gravitational Wave Astronomy*, ed. Arca Sedda, Bortolas, Spera, pub. Elsevier, arXiv: 2310.16879
44. Wang, C., **Ryu, T.**, *Blue Straggler Stars*, To appear in a chapter for *the Encyclopedia of Astrophysics*, ed. I. Mandel, F.R.N. Schneider, pub. Elsevier, arXiv: 2410.10314

Submitted Articles

43. **Ryu, T.**, Sills, A., Pakmor, R., de Mink, S., Mathieu, R., *Magnetic Field Amplification during Stellar Collisions between Low-Mass Stars*, arXiv:2410.00148 (2024)
42. Krolik, J., Piran, T., **Ryu, T.**, *Follow the Mass - A Concordance Picture of Tidal Disruption Events*, submitted to ApJ (2024), arXiv: 2409.02894
41. Herrera-Urquieta, A., Leigh, N., Pinto, J., Díaz-Cerda, G., Grondin, S. Webb, J., Mathieu, R., **Ryu, T.**, Geller, A., Kounkel, M., Toonen, S., Vilaxa-Campos, M., *Systematic method to identify runaways from star clusters produced from single-binary interactions: A case study of M67*, submitted to MNRAS (2024).
40. Wang, Y., Graham, M.J., McKernan, B., Ford, K.E.S., **Ryu, T.**, Stern, D., *Conditions for Changing-Look AGNs from Accretion Disk-Induced Tidal Disruption Events*, submitted to ApJ (2024), arXiv: 2406.12096

Articles in Refereed Journals

39. Broggi, L., Stone, N., **Ryu, T.**, Bortolas, E., Dotti, M., Bonetti, M., Sesana, A., *Repeating partial disruptions and two-body relaxation*, OJAp 7, 48 (2024), arXiv: 2404.05786
38. Vynatheya, P., **Ryu, T.**, Pakmor, R., de Mink, S., Perets, H., *Simulating the Tidal Disruption of Stars by Stellar-mass Black Holes Using Moving-mesh Hydrodynamics*, A&A 685, 45 (2024), arXiv: 2310.14852
37. **Ryu, T.**, Perna, R., Cantiello, M., *Tidal Disruption Encores*, ApJ 965, 25 (2024), arXiv: 2402.15990
36. Lazzati, D., Perna, R., **Ryu, T.**, *Ephemeral Flaring Transients Following Supernova Explosions in Black-Hole Binary Systems*, accepted for publication in ApJL (2024), arXiv:2403.18911
35. **Ryu, T.**, Amaro Seoane, P., Taylor, A., Ohlmann, S., *Collisions of Red Giants in Galactic Nuclei*, MNRAS 528, 6193 (2024), arXiv: 2307.07338

★ selected as the research highlight of the month in November 2023 by the Max Planck Institute for Astrophysics (<https://www.mpa-garching.mpg.de/1085421/hl202309>)

34. Liu, Z., **Ryu, T.**, Goodwin, A., Rau, A., Homan, D., Krumpe, M., Merloni, A., Grotova, I., Anderson, G., Malyali, A., Miller-Jones, J., *Rapid evolution of the recurrence time in the repeating partial tidal disruption event eRASSt J045650.3-203750*, A&A 683, 13 (2024), arXiv:2401.14091
33. Szekerczes, K., **Ryu, T.**, Suyu, S. H., Huber, S., Oguri, M., Dai, L. *Strong lensing of tidal disruption events: Detection rates in imaging surveys*, accepted for publication in A&A (2024), arXiv:2402.03443
32. Xin, C., H. Haiman, Z., Perna, R., Wang, Y., **Ryu, T.** *Tidal Peeling Events: Low-eccentricity Tidal Disruption of a Star by a Stellar-mass Black Hole*, ApJ 961, 149 (2024), Arxiv: 2303.12846
31. Dessart, L., **Ryu, T.**, Amaro Seoane, P., Taylor, A., *Light curves and spectra for theoretical models of high-velocity red-giant star collisions*, A&A 682, 58 (2024), arXiv: 2310.07036
30. Avara, M., Krolik, J., Campanelli, M., Noble, S., Bowen, D., **Ryu, T.**, *Accretion onto a Supermassive Black Hole Binary Before Merger*, accepted for publication in ApJ (2024), arXiv:2305.18538
29. **Ryu, T.**, McKernan, B., Ford, K.E.S., Cantiello, M., Graham, M.J., Stern, D, Leigh, N.W.C. *In-plane Tidal Disruption of Stars in Disks of Active Galactic Nuclei*, MNRAS 527, 8103 (2024), arXiv: 2310.00610
28. **Ryu, T.**, de Mink, S., Farmer, R., Pakmor, R., Perna, R., Springel, V., *Close Encounters of Star-black Hole Binaries with Single Stars*, MNRAS 527, 2734 (2024), arXiv:2307.03097
27. Bellinger, E., Caplan, M., **Ryu, T.**, Bollimpalli, D., Ball, W., Kühnel, F., Farmer, R., de Mink, S., Christensen-Dalsgaard, J, *Solar evolution models with a central black hole*, ApJ 959, 113 (2023)
26. **Ryu, T.**, Krolik, J., Piran, T., Noble, S., Avara, M., *Shocks Power Tidal Disruption Events*, 957, 12 ApJ (2023), arXiv:2305.05333
25. **Ryu, T.**, Valli, R., Pakmor, R., Perna, R., de Mink, S., Springel, V., *Close Encounters of Black Hole-star Binaries with Stellar-mass Black Holes*, MNRAS 525, 5752 (2023), arXiv:2304.01792
24. Franchini, A., Bonetti, M., Lupi A., Miniutti, G., Bortolas, E., Giustini, M. , Dotti., M., Sesana, A., Arcodia, R., **Ryu, T.** *QPEs from Impacts between the Secondary and a Rigidly Precessing Accretion Disc in an EMRI System*, A&A 675, 100 (2023), Arxiv: 2304.00775
23. Bortolas, E. , **Ryu, T.**, Broggi, L., Sesana, A. *Partial Stellar Tidal Disruption Events and Their Rates*, MNRAS 524, 3026 (2023), Arxiv: 2211.02734
22. **Ryu, T.**, Perna, R., Parkmor, R., Ma, J., Farmer, R., de Mink, S. *Close Encounters of Tight Binary Stars with Stellar-mass Black Holes*, MNRAS 519, 5787 (2023), arXiv: 2211.02734
21. **Ryu, T.**, Krolik, J., Piran, T. *Extremely Relativistic Tidal Disruption Events*, ApJL 946, 33 (2023), arXiv: 2211.00059

20. **Ryu, T.**, Perna, R., Wang, Y. *Close Encounters of Stars with Stellar-mass Black Hole Binaries*, MNRAS 516, 2204 (2022), arXiv: 2206.00603
19. **Ryu, T.**, Trani, A. A. , Leigh, N.W.C. *Tidal Disruption Events by Compact Supermassive Black Hole Binaries*, MNRAS 515, 2430 (2022), arXiv: 2202.07668
18. McKernan, B., Ford, K.E.S., Cantiello, M., Graham, M.J., Jermyn, A.S., Leigh, N.W.C., **Ryu, T.**, Stern, D. *Starfall: A Heavy Rain of Stars in 'Turning on' AGN*, MNRAS 514, 3 (2022), arXiv: 2110.03741
17. **Ryu, T.**, Krolik, J., Piran, T. *The Impact of Shocks on the Vertical Structure of Eccentric Disks*, ApJ 920.2, 130, arXiv: 2105.09434 (2021)
16. **Ryu, T.**, Krolik, J., Piran, T. *Measuring Stellar and Black Hole Masses of Tidal Disruption Events*, ApJ 904.1, 73 (2020), arXiv: 2007.13765
15. Krolik, J., Piran, T., **Ryu, T.** *Tidal Disruptions of Main Sequence Stars – V. The Varieties of Disruptions*, ApJ 904.1, 68 (2020), arXiv: 2001.03234
14. **Ryu, T.**, Krolik, J., Piran, T., Noble, N. *Tidal Disruptions of Main Sequence Stars – IV. Relativistic Effects and Dependence on Black Hole Mass*, ApJ 904.2, 101 (2020), arXiv: 2001.03504
13. **Ryu, T.**, Krolik, J., Piran, T., Noble, N. *Tidal Disruptions of Main Sequence Stars – III. Stellar Mass Dependence of the Character of Partial Disruptions*, ApJ 904.2, 100 (2020), arXiv: 2001.03503
12. **Ryu, T.**, Krolik, J., Piran, T., Noble, N. *Tidal Disruptions of Main Sequence Stars – II. Simulation Methodology and Stellar Mass Dependence of the Character of Full Tidal Disruptions*, ApJ 904.2, 99 (2020), arXiv: 2001.03502
11. **Ryu, T.**, Krolik, J., Piran, T., Noble, N. *Tidal Disruptions of Main Sequence Stars – I. Observable Quantities and their Dependence on Stellar and Black Hole Mass*, ApJ 904.2, 98 (2020), arXiv: 2001.03501
10. **Ryu, T.**, Zingale, M., Perna, R. *Turbulence-driven Thermal and Kinetic Energy in the Atmospheres of Hot Jupiters*, MNRAS 481, 5517 (2018)
9. Ibragimov, T., Leigh, N., W. C., **Ryu, T.**, Panurach, T., Perna, R. *When Do Star Clusters Become Multiple Star Systems? II. Toward a Half-life Formalism For Arbitrary Particle Masses*, MNRAS 477, 4213 (2018)
8. **Ryu, T.**, Perna, R., Haiman, Z., Ostriker, J. P., Stone, N. C. *Interactions between Multiple Supermassive Black Holes in Galactic Nuclei: a Solution to the Final Parsec Problem*, MNRAS 473, 3410 (2018)
7. Belczynski, K., **Ryu, T.**, Perna, R., Berti, E., Tanaka, T. L., Bulik, T. *On the Likelihood of Detecting Gravitational Waves from Population III Compact Object Binaries*, MNRAS 471, 4702 (2017)

6. **Ryu, T.**, Leigh, N., W. C., Perna, R. *Formation of Runaway Stars in a Star-cluster Potential*, MNRAS 470, 3049 (2017)
5. **Ryu, T.**, Leigh, N., W. C., Perna, R. *An Analytic Method for Identifying Dynamically-formed Runaway Stars*, MNRAS 470, 2 (2017)
4. **Ryu, T.**, Leigh, N. W. C., Perna, R. *Numerical Study of the $N = 4$ Binary-binary Scatterings in a Background Potential*, MNRAS 467, 4447 (2017)
3. **Ryu, T.**, Tanaka, T. L., Perna, R., Haiman, Z. *Intermediate-mass Black Holes from Population III Remnants in the First Galactic Nuclei*, MNRAS 460, 4122 (2016)
2. **Ryu, T.**, Tanaka, T. L., Perna, R. *Formation, Disruption and Energy Output of Population III X-ray Binaries*, MNRAS 456, 223 (2016)

Articles in conference proceedings

1. **Ryu, T.**, Tanaka, T. L., Perna, R. *Population III X-Ray Binaries*, in “Frontier Research in Astrophysics – II”, Italy, (2016).