

Taeho Ryu

CONTACT INFORMATION	Office 248, The Max-Planck Institute for Astrophysics, Garching, Germany	<i>E-mail:</i> tryu@mpa-garching.mpg.de <i>Webpage:</i> http://taehoryu.com
RESEARCH INTERESTS	Time domain Astronomy, Nuclear transient events, Tidal disruption events, Gravitational waves, Formation of runaway/hypervelocity stars, Supermassive black hole binaries, Accretion, Formation and interaction of Black Holes in the early universe - AGN & High-Mass X-ray Binaries, Dynamics of stellar clusters, Exoplanets.	
ACADEMIC APPOINTMENTS	The Max-Planck Institute for Astrophysics - MPA , Germany MPA fellow	2021– present
	Johns Hopkins University - JHU , USA Postdoctoral research fellow	2018 – 2021
	Stony Brook University - SUNY , USA Visiting scholar	2019 – 2020
EDUCATION	Stony Brook University - SUNY , USA Ph.D., Physics, 2018 (Advisor: Rosalba Perna) M.A., Physics, 2014	2014 – 2018
	Korea Institute for Advanced Study - KIAS , South Korea Research Assistant to Professor Kimyeong Lee (Department of Physics)	2011 – 2012
	Seoul National University - SNU , South Korea B.S. in Chemistry & Physics (Double-major/Cum Laude) Teaching Practicum in Chemistry	2011
INVITED TALKS	MPA seminar, The Max-Planck Institute for Astrophysics , Germany Title: “ <i>Performing global simulations of tidal disruption events</i> ”	10/2021
	Astro UdeC Seminar, the Universidad de Concepción , Chile Title: “ <i>Tidal disruption events of main sequence stars by supermassive black holes</i> ”	04/2021
	CTC seminar, University of Maryland , USA Title: “ <i>Physical tidal disruption radii of main-sequence stars</i> ”	06/2019
	Wine&Cheese seminar, Johns Hopkins University , USA Title: “ <i>General-relativistic determination of tidal disruption radii of main-sequence stars</i> ”	04/2019
	Stony Brook University , USA Title: “ <i>Multi-body interactions between supermassive black holes and stochastic gravitational wave background from their mergers</i> ”	4/2018
	Numerical scattering workshop, Center for Computational Astrophysics , USA Title: “ <i>background media in few-body simulations</i> ”	12/2017

	Stony Brook University, USA	11/2017
	Title: “ <i>Interactions of multiple SMBHs and their mergers</i> ” at astro group meeting	
	Stony Brook University, USA	02/2017
	in AST200 (by Prof. Jin Koda) about my BH research	
	Black Hole Network Workshop, Center for Computational Astrophysics, USA	12/2016
	Title: “ <i>Formation of Pop III X-ray binaries and their X-ray output</i> ”	
	MODEST-16 NYC Gas and Gravitational Dynamics, USA	09/2016
	Title: “ <i>X-ray Binaries and SMBHs in the Early Universe</i> ”	
	Saint-Petersburg WORKSHOP 2016, Russia	09/2016
	(not attended due to time conflict with MODEST-16 NYC)	
	Title: “ <i>Black holes from Population III remnants</i> ”	
	Frontier Research in Astrophysics – II, Italy	05/2016
	Title: “ <i>Pop III X-ray binary</i> ”	
	Astronomy Seminar, Columbia University, USA	05/2016
	Title: “ <i>Two products of the first BHs in the early universe – X-ray binaries and SMBH</i> ”	
CONTRIBUTION TALKS	SESTAS meeting, The Max-Planck Institute for Astrophysics	10/2021
	Title: “ <i>Importance of realistic structure and relativity in modelling tidal disruption events</i> ”	
	HotSci@JHU/STScI, STScI	08/2021
	Title: “ <i>Measuring stellar and black hole masses of tidal disruption events</i> ”	
	European Astronomical Society Annual Meeting, Leiden	07/2021
	Title: “ <i>Stellar and black hole mass inference of tidal disruption events</i> ”	
	Tidal Disruptions in Kyoto: Confronting Theory with Observations, Yukawa Institute for Theoretical Physics, Kyoto university, Japan	01/2020
	Title: “ <i>A few key quantities of tidal disruption events measured using fully general relativistic simulations</i> ”	
POSTER	Distorted Astrophysical disks: new insights and future directions, University of Cambridge	05/2021
	Title: “ <i>The Impact of Shocks on the Vertical Structure of Eccentric Disks</i> ”	
	The 7th Annual Johns Hopkins Postdoctoral Conference	04/2021
	Title: “ <i>The Vertical Structure of Eccentric Disks</i> ”	
HONORS, AWARDS AND AFFILIATION	Department of Physics & Astronomy, SUNY	5/2018
	Dresden Prize (for outstanding theoretical thesis prize)	
	Department of Physics & Astronomy, SUNY	5/2016
	Peter B. Kahn Fellowship	
	SNU Alumni Association of Greater New York - SNUANY	11/2014

	SNUANY Scholarship Award	
	SNU Alumni Association of Greater New York - SNUANY SNUANY Scholarship Award	12/2013
	Department of Physics & Astronomy, SUNY The Benjamin Lee Award	05/2013
	Seoul National University , South Korea SNU Outstanding Student (Twice winner)	2009 – 2010
	Korea Student Aid Foundation , South Korea National Scholarship for Science & Engineering (Thrice winner)	2009 – 2010
	Seoul National University , South Korea SNU Scholarship for Superior Academic Performance (Five-time winner)	2005 – 2007
	Korean-American Scientists and Engineers Association - KSEA A Member of KSEA	
PROFESSIONAL SERVICE	Referee for <i>Monthly Notices of the Royal Astronomical Society</i>	
OUTREACH	The Johns Hopkins Korean Graduate Student Association, JHU, USA Invited public talk for Networking night (annual event) Topic: Black holes	Nov. 1st 2019
STUDENT SUPERVISION	Alonso Herrera (Master student, co-supervised with prof. Nathan Leigh), Universidad de Concepción José Pinto (Master student, co-supervised with prof. Nathan Leigh), Universidad de Concepción	
CERTIFICATION	Korean National Teacher Certification	2011
	Craftsman Information Processing Certification - HR Development Service of Korea	2009
COMPUTER PROFICIENCY	Expertise in: C/C++, Fortran, python, Mathematica, high-performance computing (more than 100M CPU hours)	
ACADEMIC EXPERIENCE	Department of Physics and Astronomy, SUNY, USA Graduate Assistant (Advisor: Professor Rosalba Perna) Topic: Formation and evolution of black holes in the history of the Universe and their observational imprints Topic: Atmospheric evolution of hot Jupiters	Fall 2014 - 2019
	C.N Yang Institute for Theoretical Physics, SUNY, USA Research Assistant (Advisor: Professor Warren D. Siegel) Topic: Ads/CFT correspondence. Computing propagator for scalar field in two stacks of D-brane background and Spontaneously Symmetry broken N=4 D=4 Super Yang-mills Theory	Summer 2013
	Department of Physics & Astrophysics, SNU, South Korea Internship (Advisor: Professor Sunkee Kim)	Winter 2010

	World Class University - WCU - Center for High Energy Physics Experiment preparations; Study of Neutron Detector control Thesis: <i>Characterizing efficiencies of two different neutron detectors in efficiency</i>	
	Department of Chemistry, SNU, South Korea Internship (Advisor: Professor Sangyoub Lee) Theoretical & Computational Chemistry, Biophysics, Polymer Physics Laboratory Topic: Computer Programming for Chemistry and Coding - CHARMM Thesis: <i>Molecular dynamics simulation of a sodium chloride ion pair in water</i>	2010 – 2010
ACADEMIC LEADERSHIP	Department of Chemistry, SNU, South Korea Department Activities Representative and Organizer (Student competitions, membership training, freshmen welcoming, etcetera)	2005 – 2006
	SNU Campus Life and Culture Center, SNU, South Korea Mentor-team Manager in SNU Mentoring Program Elected Leader (30 members, My team chosen Best Team of the Year)	2010 – 2011
VOLUNTEER PARTICIPATION	Language Education Institute, SNU, South Korea Teaching Assistant Program: Korean and Korean Culture for International Students	Spring 2011
	SNU Obstacle Person Support Center, SNU, South Korea Assistant to a hearing-impaired student, and provider of study aid	Spring 2009
	Seoul Metropolitan Office of Education, SNU, South Korea Teaching Assistant, high-school mathematics, Donghaeng Project	Spring 2009
EXTRA- CURRICULAR ACTIVITY	Kyujanggak Institute for Korean Studies, SNU, South Korea Docent Program: Improving public understanding of Documentary Heritage of Chosun Dynasty	Spring 2011
	Museum of Art, SNU, South Korea Docent Program: Improving understanding of interactive media art in The Garden of Forking Paths	Spring 2011
	Central Library, SNU, South Korea Teaching Assistant Program: Enhancing librarians' grasp of basic scientific concepts in chemistry and physics	Spring 2009
	Seoul, South Korea Runner-up, national kendo competition sponsored by the city of Seoul	Summer 1997
LANGUAGE PROFICIENCY	In English - Advanced proficiency in Reading, Writing, Listening, Speaking In Korean - Native proficiency	
MILITARY SERVICE	Military Required Service, South Korea	2007 – 2009
PERSONAL	<i>Citizenship</i> : Korean citizen. US permanent resident	

Publications

Articles in refereed Journals

17. 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*, Submitted to MNRAS, arXiv: 2110.03741 (2021)
16. **Ryu, T.**, Krolik, J., Piran, T. *The Impact of Shocks on the Vertical Structure of Eccentric Disks*, Accepted for publication in ApJ, arXiv: 2105.09434 (2021)
15. **Ryu, T.**, Krolik, J., Piran, T. *Measuring stellar and black hole masses of tidal disruption events*, ApJ, 904.1, 73 (2020), arXiv: 2007.13765
14. 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
13. **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
12. **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
11. **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
10. **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
9. **Ryu, T.**, Zingale, M., Perna, R. *Turbulence-driven thermal and kinetic energy in the atmospheres of hot Jupiters*, MNRAS, 481, 5517 (2018)
8. 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)
7. **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)
6. 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)
5. **Ryu, T.**, Leigh, N., W. C., Perna, R. *Formation of runaway stars in a star-cluster potential*, MNRAS, 470, 3049 (2017)
4. **Ryu, T.**, Leigh, N., W. C., Perna, R. *An analytic method for identifying dynamically-formed runaway stars*, MNRAS, 470, 2 (2017)
3. **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)

2. **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)
1. **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).