

# Hyerin Cho (조혜린)

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EDUCATION	Center for Astrophysics   Harvard & Smithsonian Ph.D. Candidate	Sep. 2020 - Present
	GIST(Gwangju Institute of Science and Technology), <i>cum laude</i> B.S. Physics Major/Math Minor Total GPA: 4.0/4.5 (3.7/4.0 U.S. scale) Major GPA: 4.4/4.5 (4.0/4.0 U.S. scale) <sup>1</sup>	Mar. 2015 - Feb. 2020
	California Institute of Technology Study Abroad Program Total GPA: 3.9/4.3	Sep. 2017 - Dec. 2017
	University of California, Berkeley Summer Session	Jun. 2016 - Aug. 2016
RESEARCH EXPERIENCE	Seoul National University Visiting Student Intern Supervisor: Prof. Ji-hoon Kim Work in progress	Mar. 2020 - Aug. 2020
	OzGrav, Swinburne University of Technology Visiting Student Intern Supervisors: Prof. Matthew Bailes, Prof. Adam Deller, Dr. Ryan Shannon <i>Localized ASKAP FRBs' high time resolution and their analysis.</i> The work is continued from the previous project from CIRA, which is improving my software that recovers full time resolution of localized ASKAP FRB voltage data. I have generalized this software for any localized sources for ASKAP and have done high time resolution analysis. This has opened up new ways to study both FRBs and the matter that their radiation encounters on its trek through the Universe. My software and analysis led to new results about the properties of matter in the outer parts of galaxies (its "halo"), as probed by an FRB. Therefore, I am a co-author of a paper on these results, published in the journal <i>Science</i> in October 2019.	Mar. 2019 - Jun. 2019
	Curtin Institute of Radio Astronomy (CIRA) Visiting Research Associate / Summer Studentship Supervisors: Prof. Jean-Pierre Macquart, Dr. Clancy James, Dr. Ian Morrison <i>Recovering the full time resolution of ASKAP FRB voltage data.</i> As a member of The Commensal Real-time ASKAP Fast Transients Survey (CRAFT) collaboration, I worked on inverting channelization of voltage data (a data processing method called polyphase filterbank inversion) to retrieve its full time resolution. Having access to ASKAP's highly resolved voltage data is expected to reveal significant information including the source's emission properties and FRBs' fine temporal and spectral structure.	Dec. 2018 - Feb. 2019

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<sup>1</sup>The courses with PS(Physics) course code in GIST transcript, including courses taken at Caltech.

**Caltech Theoretical Astrophysics** Jun. 2018 - Aug. 2018  
*Summer Undergraduate Research Fellow*  
 Supervisor: Prof. Sterl Phinney

*Numerical modeling of time-independent accretion discs with instabilities.*  
 I wrote Python scripts from scratch that solves the time-independent accretion disc equations numerically. These included OPAL and Ferguson opacities, equations of state, and treatment of convection. The purpose of the project was to make realistic and general models of accretion discs covering a wide parameter space from Cataclysmic Variables to Active Galactic Nuclei and to investigate instabilities caused by the onset of convection and hydrogen recombination.

**GIST General Intelligence and Smart Environment Laboratory**  
*Student Intern* Oct. 2015 - Aug. 2017  
 Supervisor: Prof. Kin Choong Yow

*Studying deep learning and its applications to physics problems.*  
 I learned object oriented programming with C++, and deep learning with Google's Tensorflow. Also, I worked on a project to derive physical formulae from data based on Google's TensorFlow Python scripts.

## PUBLICATIONS [arXiv](#), [ads](#)

- Articles published or accepted in refereed journals
  - J. X. Prochaska et. al. 2019 [Science](#), 366, "The low density and magnetization of a massive galaxy halo exposed by a fast radio burst"
  - **Hyerin Cho** et. al. 2020 [ApJL](#), 891, "Spectropolarimetric analysis of FRB 181112 at microsecond resolution: Implications for Fast Radio Burst emission mechanism"
  - M. W. Sammons et. al. 2020 [ApJ](#), 900, "First constraints on compact dark matter from Fast Radio Burst microstructure"
  - S. Bhandari et. al. 2020, accepted to [ApJL](#), "Limits on precursor and afterglow radio emission from a fast radio burst in a star-forming galaxy" [arXiv:2008.12488](#)

**TALKS**

<i>Caltech SURF Seminar Day</i>	Aug. 2018
<i>ICRAR Summer Student Talk</i>	Feb. 2019
<i>GIST SNL ("Science" Night Live) talk on FRBs</i>	October 2019

**TEACHING EXPERIENCE**

<i>Teaching Assistant</i>	Sep. 2019 - Dec. 2019
GIST MM4016 Introduction to Topology (4th-year course)	

<i>Teaching Assistant</i>	Mar. 2018 - Jun. 2018
GIST PS3101 Electromagnetism II (3rd-year course)	

**AWARDS & FELLOWSHIPS**

Korea National Science and Engineering Scholarship <sup>2</sup>	Mar. 2015 - Feb. 2020
Caltech Summer Undergraduate Research Fellowship	Jun. 2018 - Aug. 2018
CIRA Summer Studentship	Dec. 2018 - Feb. 2019
GIST Outstanding Thesis Award (우수논문상)	Feb. 2020
GIST Future Research Talent Award (미래인재상)	Feb. 2020
Ilju Foundation Study Abroad Doctoral Program Scholarship	Aug. 2020 - Jul. 2024

<sup>2</sup>Full tuition covered for 8 semesters from Korea Student Aid Foundation, Ministry of Education ([국가이공계장학금](#))

<b>TECHNOLOGY SKILLS</b>	<i>Programming Languages:</i>	
	Working knowledge of:	Python, MATLAB, bash
	Familiar with:	C++, C, C shell, Mathematica
	Basic knowledge of:	Fortran
	<i>Operating Systems:</i> Linux, Windows	
	<i>Others:</i> MESA, TensorFlow	
<b>LANGUAGE PROFICIENCY</b>	Korean (native)	
	English (fluent <sup>3</sup> )	
	Japanese, Chinese (basic knowledge)	
<b>OTHER ACTIVITIES</b>	GIST student ambassador, <i>Member</i>	Mar. 2015 - Dec. 2015
	GIST student council, <i>Member</i>	Jun. 2015 - Feb. 2016
	GIST student ambassador, <i>Vice President</i>	Dec. 2015 - Dec. 2016
	MESA <sup>4</sup> Summer School, <i>Student</i>	Aug. 2018
	Palomar Observatory observing proposal accepted for one night	Aug. 2018
	Spectroscopic follow-up observation of several short period binaries discovered with ZTF	
	APCTP <sup>5</sup> -NIMS-KISTI-UNIST-KASI Summer School on Numerical Relativity and Gravitational Waves, <i>Student</i>	
		Jun. 2019
	CTPU <sup>6</sup> Summer School on Cosmology and Particle Physics, <i>Student</i>	Jul. 2019
	2019 CASPER Workshop & PIRE DSP School, <i>Student</i>	Aug. 2019
	Accepted to get student travel/accommodation support to Harvard	
	Student-led study group	Sep. 2019 - Dec. 2019
	I taught General Relativity and my study plan and notes can be found <a href="#">here</a>	
<b>TEST SCORES</b>	Physics GRE 990/990	
	General GRE Verbal(158/170), Quantitative(169/170), Analytical Writing(4/6)	
	TOEFL 111/120	
<b>HOBBIES</b>	Hiphop dance	
	I was a practice director of a dance club in GIST, and I was also an instructor for a hiphop class in Caltech.	
	Yoga, especially aerial yoga or pilates	

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<sup>3</sup>Cumulative 3 years living in the U.S. during middle school and university. 6 months living in Australia during research internships.

<sup>4</sup>Modules for Experiments in Stellar Astrophysics

<sup>5</sup>[Asia Pacific Center for Theoretical Physics](#)

<sup>6</sup>[Center for Theoretical Physics of the Universe, Institute for Basic Science, Korea](#)