

Hyerin Cho

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EDUCATION

GIST(Gwangju Institute of Science and Technology), Korea
B.S. Physics Major, Math Minor March 2015 - Present
Overall GPA: 4.0/4.5
Major GPA: 4.4/4.5 ¹

California Institute of Technology September 2017 - December 2017
Study Abroad Program
Ph127a Statistical Mechanics,
Ph77a Advanced Physics Laboratory,
ACM116 Introduction to Probability Models,
Ay20 Basic Astronomy and the Galaxy,
Ph103 Atomic and Molecular Physics(audit), Ph125a Quantum Mechanics(audit)

University of California, Berkeley June 2016 - August 2016
Summer Session
Chemical Structure and Reactivity
The Beauty and Joy of Computing

RESEARCH EXPERIENCE

OzGrav, Swinburne University of Technology March 2019 - Present
Visiting Student Intern
Supervisor: Prof. Matthew Bailes
Pipeline of Full Time Resolution Recovery for Localized ASKAP FRBs.
The work is continued from the previous project from CIRA. I am working on refining the reconstruction process for FRB180924 for more accurate results, and will generalize this process to a pipeline applicable for any localized ASKAP FRBs. FRB181112 will also be reconstructed for high resolution time domain FRB science.
Population Analysis for Radio Telescopes.
Work in progress.

Curtin Institute of Radio Astronomy (CIRA) December 2018 - February 2019
Visiting Research Associate / Summer Studentship
Supervisor: Dr. Clancy James, Professor Jean-Pierre Macquart
Recovering the Full Time Resolution of ASKAP FRB Voltage Data.
As a member of The Commensal Real-time ASKAP Fast Transients Survey ([CRAFT](#)) team, I worked on inverting channelization of voltage data to retrieve its full time resolution. ASKAP's high time-resolved voltage data enables quantum optical analysis of FRBs. This new diagnosis of FRBs is expected to reveal information about the source's emission properties, and thus help solve the mystery of its origin. I took voltage data from ASKAP and recovered its full time resolution via off-line processing. In particular, I used ASKAP's first localized FRB180924, but this process will be applicable to all ASKAP's localized FRBs. Most of my work was done with Python to coherently sum signals

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

from antennas, invert the channelization (PFB), and coherently de-disperse.

Caltech Theoretical Astrophysics

June 2018 - August 2018

Summer Undergraduate Research Fellow

Supervisor: Professor Sterl Phinney

Numerical Modeling of Time-Independent Accretion Discs with Instabilities.

I wrote from scratch Python code 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 all 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

October 2015 - August 2017

Supervisor: Professor Kin Choong Yow

Studying Deep Learning and its applications to physics problem.

I worked on a project to derive physical formulas from data by modifying Google's TensorFlow Python code.

**TEACHING
EXPERIENCE**

Teaching Assistant

March 2018 - June 2018

GIST PS3101 Electromagnetism II (3rd year course)

I was selected to be the Teaching Assistant as the best student of previous year's class. I graded problem sets, midterm and final exams. I also held weekly office hours to answer questions from students.

PUBLICATIONS

Reconstruction of ASKAP FRBs to the Order of a Nanosecond Time Resolution via Polyphase Filterbank Inversion

First author (*in preparation*)

TALKS

Caltech SURF Seminar Day

August 2018

Presentation of summer research project.

ICRAR Summer Student Talk

February 2019

Presentation of summer research project.

**AWARDS &
FELLOWSHIPS**

Korea National Science and Engineering Scholarship²

March 2015 - Present

Caltech Summer Undergraduate Research Fellowship

June 2018 - August 2018

CIRA Summer Studentship

December 2018 - February 2019

**TECHNOLOGY
SKILLS**

Programming Languages:

Working knowledge of: Python, MATLAB, bash

Familiar with: C++, Mathematica

Basic knowledge of: Fortran, C, html

Operating Systems: Linux, Windows

Others: MESA, TensorFlow

**LANGUAGE
PROFICIENCY**

Korean (native)

English (fluent³)

²Full tuition covered for four years.

³Cumulative 3 years in the U.S. during middle school and university.

Japanese, Chinese (basic knowledge)

**OTHER
ACTIVITIES**

GIST student ambassador, <i>Member</i>	March 2015 - December 2015
GIST student council, <i>Member</i>	June 2015 - February 2016
GIST student ambassador, <i>Vice President</i>	December 2015 - December 2016
MESA ⁴ Summer School, <i>Student</i>	August 2018
Palomar Observatory observing proposal accepted for one night	August 2018
Spectroscopic follow-up observation of several short period binaries discovered with ZTF	

HOBBIES

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.

⁴Modules for Experiments in Stellar Astrophysics