# HYERIN CHO (조혜린)

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Website ◇ Google Scholar ◇ Github

## RESEARCH INTERESTS

High-energy astrophysics; Black holes; General relativity; Plasma physics; Galaxy evolution; GRMHD simulations; Accretion; Relativistic Jets

## EDUCATION

**Harvard University**, USA — expected May 2026
Ph.D. in Astronomy and Astrophysics
*Advisor: Ramesh Narayan*
*Committee: Lars Hernquist (chair), Ramesh Narayan, John Raymond, Aneta Siemiginowska*

**GIST(Gwangju Institute of Science and Technology)**, Korea — Feb. 2020
B.S. Physics Major / Math Minor (*cum laude*)

**California Institute of Technology**, USA — Dec. 2017
Study Abroad Program

## RESEARCH EXPERIENCE

**Black Hole Initiative, Harvard University**, Graduate Research Assistant — 2020 - present
Advisor: Prof. Ramesh Narayan
*Black hole (BH) accretion and feedback using GRMHD simulations and analytical models*

**Seoul National University**, Visiting Student Intern — 2020
Advisor: Prof. Ji-hoon Kim
*Accretion onto massive BHs in galaxy simulations*

**OzGrav, Swinburne University of Technology**, Visiting Student Intern — 2019
Advisors: Prof. Matthew Bailes, Prof. Adam Deller, Prof. Ryan Shannon
*High time resolution analysis on Fast Radio Bursts (FRBs)*

**Curtin Institute of Radio Astronomy (CIRA)**, Summer Studentship — 2019
Advisors: Prof. Jean-Pierre Macquart, Dr. Clancy James, Dr. Ian Morrison
*Development to recover the full time resolution of FRB voltage data*

**Caltech Theoretical Astrophysics**, Summer Undergraduate Research Fellow — 2018
Advisor: Prof. Sterl Phinney
*Numerical modeling of time-independent accretion discs with instabilities*

## PUBLICATIONS

**h-index: 9, citations > 600** (11/01/2025) Google Scholar, ads, arXiv

First-author articles

1. **Cho H.**, Prather B. S., Narayan R., Su K.-Y., Natarajan P., 2025, accepted to ApJ, "*Bridging Scales in Black Hole Accretion and Feedback: Relativistic Jet linking the Horizon to the Host Galaxy*"
2. **Cho H.** and Narayan R., 2025, ApJ, 991, "*Variability in Black Hole Accretion: Dependence on Rotational and Magnetic Energy Balance*"
3. **Cho H.**, Prather B. S., Su K.-Y., Narayan R., Natarajan P., 2024, ApJ, 977, "*Multizone Modeling of Black Hole Accretion and Feedback in 3D GRMHD: Bridging Vast Spatial and Temporal Scales*"

4. **Cho H.**, Prather B. S., Narayan R., Natarajan P., Su K.-Y., Ricarte A., Chatterjee K., 2023, ApJL, 959, "*Bridging Scales in Black Hole Accretion and Feedback: Magnetized Bondi Accretion in 3D GRMHD*"
   - featured in AASnova
5. **Cho H.** and Narayan R., 2022, ApJ, 932, "*Analytical Model of Disk Evaporation and State Transitions in Accreting Black Holes*"
6. **Cho H.**, Macquart J.-P., Shannon R. M., Deller A. T., Morrison I. S., Ekers R. D., Bannister K. W., et al., 2020, ApJL, 891, "*Spectropolarimetric analysis of FRB 181112 at microsecond resolution: Implications for Fast Radio Burst emission mechanism*"
   - featured in astrobites

Co-authored articles

1. Su K.-Y., Ricarte A., Natarajan P., Porras-Valverde A. J., **Cho H.**, Narayan R., Faucher-Giguère C.-A., et al., 2025, submitted to ApJL, "*Bridging scales: How much do supermassive black holes grow in the suppressed Bondi regime?*"
2. Porras-Valverde A. J., Natarajan P., Ricarte A., Su K.-Y., **Cho H.**, Narayan R., Prather B. S., 2025, submitted to ApJ, "*Bridging scales: Modeling suppressed Bondi accretion on black holes and its impact on galaxy growth*"
3. Su K.-Y., Natarajan P., **Cho H.**, Narayan R., Hopkins P. F., Anglés-Alcázar D., Prather B. S., 2025, ApJL, 981, "*Bridging Scales: Coupling the Galactic Nucleus to the Larger Cosmic Environment*"
4. Sutinjo A. T., Scott D. R., James C. W., Glowacki M., Bannister K. W., **Cho H.**, Day C. K., et al., 2023, ApJ, 954, "*Calculation and Uncertainty of Fast Radio Burst Structure Based on Smoothed Data*"
5. Scott D. R., **Cho H.**, Day C. K., Deller A. T., Glowacki M., Gourdji K., Bannister K. W., et al., 2023, A&C, 44, "*CELEBI: The CRAFT Effortless Localisation and Enhanced Burst Inspection pipeline*"
6. Bhandari S., Bannister K. W., Lenc E., **Cho H.**, Ekers R., Day C. K., Deller A. T., et al., 2020, ApJL, 901, "*Limits on precursor and afterglow radio emission from a fast radio burst in a star-forming galaxy*"
7. Sammons M. W., Macquart J.-P., Ekers R. D., Shannon R. M., **Cho H.**, Prochaska J. X., Deller A. T., et al., 2020, ApJ, 900, "*First constraints on compact dark matter from Fast Radio Burst microstructure*"
8. Prochaska J. X., ..., **Cho H.**, ... 2019 Science, 366, "*The low density and magnetization of a massive galaxy halo exposed by a fast radio burst*"

## PRESENTATIONS

Seminars & Colloquia & Meetings († invited)

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| 1. | † Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) Tea Talk (online) | Nov. 2025 |
| 2. | † Theoretical High Energy Astrophysics Group meeting (Columbia, USA) | Nov. 2025 |
| 3. | † CCA Stars & Plasma Astrophysics group meeting (CCA, USA) | Nov. 2025 |
| 4. | † Bahcall lunch talks (IAS, USA) | Nov. 2025 |
| 5. | † TAPIR seminar / Astronomy Tea Talks (Caltech, USA) | Oct. 2025 |
| 6. | † CIERA Theory Group Meeting (Northwestern, USA) | Oct. 2025 |
| 7. | † CCA-NY area community galaxy formation seminar (CCA, USA) | Oct. 2025 |
| 8. | † EHT theory working group (online) | Sep. 2025 |
| 9. | Umbrela Dialogues (Harvard, USA) | Jan. 2025 |
| 10. | † Quataert group meeting (Princeton, USA) | Nov. 2024 |

11. † Astro coffee (IAS, USA) Nov. 2024
12. † Strong Gravity Seminar (Perimeter Institute, Canada) Apr. 2024
13. † Plasma-astro meeting (CITA, Canada) Apr. 2024
14. † University of Illinois Urbana-Champaign Journal Club (online) Feb. 2024
15. ITC luncheon talks (Harvard, USA) Feb. 2024
16. Kim group meeting (Seoul National University, Korea) Jan. 2024
17. † ITC luncheon talks (Harvard, USA) Mar. 2023
18. † ZARM Accretion disk and relativistic astrophysics (online) Nov. 2022
19. † Curtin University Colloquium (online) May 2022

Conference & Workshop († invited)

1. † **Talk** The multiscale environment of AGN across cosmic time (MPA, Germany) 2025
   *"Bridging Scales in Black Hole Accretion and Feedback: Relativistic Jet linking the Horizon to the Host Galaxy"*
2. **Talk** Deciphering Cosmic Code for Galaxy Formation (Puerto Varas, Chile) 2024
   *"Bridging Scales in Black Hole Accretion and Feedback in GRMHD"*
3. **Talk** Tinsley Workshop (Yale, USA) 2024
   *"Bridging Scales in the Black Hole Accretion-Feedback"*
4. **Talk** Bridging Scales Workshop (Harvard, USA) 2024
   *"Simulations of Coupled Feeding & Feedback"*
5. **Talk** The Event Horizon and Beyond - Celebrating 50 Years of Narayan (Harvard, USA) 2024
   *"Bridging Scales in AGN Accretion and Feedback"*
6. **Talk** Resolving Galaxy Ecosystems Across All Scales (CUHK, Hong Kong) 2023
   *"Bridging scales between supermassive black holes and their host galaxies via multi-annuli approach"*
7. **Talk** Black Holes on Broadway: The Next Generation of AGN Models in Galaxy Formation (CCA, USA) 2023
   *"Bridging Scales between Supermassive Black Holes and Their Host Galaxies via Multi-annuli Approach"*
8. **Talk** Boston-Area Blackhole Accretion Meeting (BABAM!) (Harvard, USA) 2023
   *"Bridging Scales in Black Hole Accretion and Feedback"*
9. **Poster** AAS (Pasadena, USA) 2022
   *"Analytical Model of Disk Evaporation and State Transitions in Accreting Black Holes"*
10. **Talk** ngEHT meeting (Granada, Spain) 2022
    *"Analytical Model of Disk Evaporation and State Transitions in Accreting Black Holes"*
11. **Talk** New England Regional Quasar and AGN Meeting (NERQUAM) (UConn, USA) 2022
    *"Analytical Model of Disk Evaporation and State Transitions in Accreting Black Holes"*

## AWARDS & FELLOWSHIPS

**ACCESS Explore** (PI: **Hyerin Cho**, PHY250303) 2025 - present

**ACCESS Maximize** (PI: Ramesh Narayan, AST080028) 2024 - 2025

**ACCESS Explore** (PI: **Hyerin Cho**, PHY230079) 2023 - 2024

**Ilju Foundation Study Abroad Scholarship** 2020 - 2024
Selected as 1 of 6 recipients nationwide in Korea across all disciplines for a prestigious doctoral scholarship ($\sim$ \$120,000 USD over four years) awarded to support Ph.D. studies abroad.

**Talent Award of Korea** (대한민국인재상) 2020

Awarded by the South Korean government to outstanding young leaders demonstrating excellence, creativity, and public service. Selected as one of the top national recipients representing Korea's next-generation talent.

**GIST Outstanding Thesis Award** (우수논문상) 2020

**GIST Future Research Talent Award** (미래인재상) 2020

**Korea National Science and Engineering Scholarship** (국가이공계장학금) 2015 - 2020
A scholarship to fund full tuition for 8 semesters from Korea Student Aid Foundation, Ministry of Education

## TEACHING EXPERIENCE

Harvard University

**Teaching Assistant** Galactic and Extragalactic Astronomy (undergraduate course) Fall 2022

**Teaching Assistant** Radiative Processes in Astrophysics (graduate course) Fall 2021

GIST

**Teaching Assistant** Introduction to Topology (4th-year course) Fall 2019

**Teaching Assistant** Electromagnetism II (3rd-year course) Spring 2018

## SERVICE, OUTREACH, ORGANIZATIONAL EXPERIENCE

Outreach

- Crescent Street Halloween Party "Ask an Astrophysicist" 2025
- Research Talk for Harvard-Smithsonian Science Research Mentoring Program (SRMP) 2024
- Black Hole Scholars talk at Buckingham Browne & Nichols School 2024
- Interviewed as a guest of an episode of Astrophiz podcast 2023
- Translating articles in Korean for World of Women in STEM (WOWSTEM) website 2022 -
- Women in STEM (WiSTEM) Mentor 2020 - 2021

Peer Review: Nature astronomy 2021

Conference Services

- **Local Organizing Committee** RN50 Conference The Event Horizon and Beyond - Celebrating 50 Years of Narayan 2024
- **Session Chair** 7th Annual Black Hole Initiative Conference 2024
- **Local Organizing Committee** Bridging Scales Workshop 2024
- **Local Organizing Committee** Boston-Area Blackhole Accretion Meeting (BABAM!) 2023

Narayan Group Meeting Organizer 2023 - present

## REFERENCES

**Ramesh Narayan**
Thomas Dudley Cabot Professor of the Natural Sciences
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**Priyamvada Natarajan**
Joseph S. and Sophia S. Fruton Professor of Astronomy and Professor of Physics
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