

Postdoctoral Research Associate
Department of Astrophysical Sciences
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Employment

10/2022–present **Postdoctoral Research Associate**, Princeton University

Education

09/2016–08/2022 **PhD in Astronomy**, Seoul National University

03/2012–08/2016 **BS in Astronomy (minor: physics)**, Seoul National University

Honors

08/2022 **Best PhD Thesis Award**, College of Natural Sciences, Seoul National University

03/2017–02/2022 **Global Ph.D. Fellowship**, National Research Foundation of Korea

Advising Experience

2022–2024 **Woorak Choi**, PhD student in Yonsei University, *Giant molecular clouds in the nuclear ring of barred galaxies*, co-advised with Prof. Aeree Chung and Dr. Chang-Goo Kim

Code Development Contributions

2021–present Core developer of the TIGRESS++ project (private repository)

2024 **tesphere**: A python implementation of the turbulent equilibrium sphere model

2023 **GRID-dendro**: A python implementation of the hierarchical structure identification algorithm

2018–2019 **James-0BC**: MPI + C++ implementation (in *Athena++* code) of the James algorithm for self-gravity in 3D Cartesian/cylindrical coordinates.

Competitively-Obtained Computing Time

2021 National Supercomputing Center, KISTI, Korea (1.4×10^7 core-hours)
Co-I: Effects of Magnetic Fields on Star Formation in Galactic Nuclear Rings and Formation of Circumnuclear Disks

2019 National Supercomputing Center, KISTI, Korea (2.0×10^7 core-hours)
Co-I: Understanding Star Formation in Centers of Disk Galaxies

Publications

In press **Moon, S.** and Ostriker, E. C. **Prestellar Cores in Turbulent Clouds: Properties of Critical Cores.** (*accepted for publication in ApJ*)

In press **Moon, S.** and Ostriker, E. C. **Prestellar Cores in Turbulent Clouds: Numerical Modeling and Evolution to Collapse.** (*accepted for publication in ApJ*)

11/2024 **Moon, S.** and Ostriker, E. C. (2024). **Theory of Turbulent Equilibrium Spheres with Power-law Linewidth–Size Relation.** *The Astrophysical Journal*, 975, 295.

07/2024 Choi, W. et al. (including **Moon, S.**). [WISDOM Project - XXI. Giant molecular clouds in the central region of the barred spiral galaxy NGC 613: a steep size-linewidth relation](#). *Monthly Notices of the Royal Astronomical Society*, 531, 4045.

04/2023 **Moon, S.**, Kim, W.-T., Kim, C.-G., and Ostriker, E. C. (2023). [Effects of Magnetic Fields on Gas Dynamics and Star Formation in Nuclear Rings](#). *The Astrophysical Journal*, 946, 114.

01/2022 **Moon, S.**, Kim, W.-T., Kim, C.-G., and Ostriker, E. C. (2022). [Effects of Varying Mass Inflows on Star Formation in Nuclear Rings of Barred Galaxies](#). *The Astrophysical Journal*, 925, 99.

06/2021 **Moon, S.**, Kim, W.-T., Kim, C.-G., and Ostriker, E. C. (2021). [Star Formation in Nuclear Rings with the TIGRESS Framework](#). *The Astrophysical Journal*, 914, 9.

04/2019 **Moon, S.**, Kim, W.-T., and Ostriker, E. C. (2019). [A Fast Poisson Solver of Second-order Accuracy for Isolated Systems in Three-dimensional Cartesian and Cylindrical Coordinates](#). *The Astrophysical Journal Supplement Series*, 241, 24.

09/2016 Kim, W.-T. and **Moon, S.** (2016). [Equilibrium Sequences and Gravitational Instability of Rotating Isothermal Rings](#). *The Astrophysical Journal*, 829, 45.

Recent Presentations (past 5 years)

05/2025 **Invited Talk**, *The Puzzles of Star Formation*, Ringberg Castle, Germany

03/2025 **Seminar**, *Thunch*, Princeton Univ., Princeton, USA

02/2025 **Seminar**, *Bahcall Lunch*, Princeton Univ., Princeton, USA

11/2024 **Seminar**, American Museum of Natural History, New York, USA

08/2024 **Invited Talk**, *Star Formation Workshop*, McMaster University, Hamilton, Canada

06/2024 **Seminar**, Kyung Hee Univ., Suwon, Korea

06/2024 **Seminar**, Chungnam Nat'l Univ., Daejeon, Korea

06/2024 **Seminar**, Korea Astronomy and Space Science Institute, Daejeon, Korea

06/2024 **Seminar**, Yonsei Univ., Seoul, Korea

06/2024 **Seminar**, Seoul Nat'l Univ., Seoul, Korea

06/2024 **Seminar**, Center for Computational Astrophysics, New York, USA

05/2024 **Poster**, *The Early Phase of Star Formation*, Ringberg Castle, Germany

02/2024 **Seminar**, Space Telescope Science Institute, Baltimore, USA

02/2024 **Seminar**, *Star Formation/ISM Rendezvous*, Princeton Univ., Princeton, USA

12/2023 **Seminar**, *Bahcall Lunch*, Institute of Advanced Study, Princeton, USA

06/2023 **Poster**, *The Physics of Star Formation*, Lyon, France

05/2023 **Invited Talk**, *Athena++ Workshop*, New York, USA

04/2023 **Contributed Talk**, *Galactic Center Workshop*, Granada, Spain

08/2022 **Contributed Talk**, *IAU Symposium 373*, Busan, Korea (*e-talk*)

06/2022 **Poster**, AAS 240, Pasadena, USA

04/2022 **Contributed Talk**, *KAS Spring Meeting*, Busan, Korea

01/2022	Seminar , Korea Astronomy and Space Science Institute, Daejeon, Korea
01/2022	Workshop , <i>Origins Workshop</i> , Salt Lake City, USA (<i>virtual</i>)
11/2021	Seminar , Heidelberg Univ., Germany (<i>virtual</i>)
11/2021	Seminar , Center for Computational Astrophysics, New York, USA (<i>virtual</i>)
10/2021	Contributed Talk , <i>KAS Fall Meeting</i> , Jeju, Korea
04/2021	Contributed Talk , <i>KAS Spring Meeting</i> (<i>virtual</i>)
01/2021	Workshop , <i>2nd Numerical Galaxy Formation Mini-Workshop</i> , Seoul, Korea (<i>virtual</i>)
01/2020	Workshop , <i>Numerical Galaxy Formation Mini-Workshop</i> , Seoul, Korea

Professional Services and Teaching Experience

2024–present	Referee , The Astrophysical Journal; Astronomische Nachrichten
2022–present	Regular Host , Astro-coffee discussion at Princeton Astrophysics
2021–2022	Founder and Organizer , SNU Astronomy Graduate Student Journal Club
2019	Founding Member , SNU Open Astronomy Innovation Group
2018–2019	Founder and Organizer , SNU Astronomy Graduate Student Colloquium (aka Golloquium)
2017	Graduate Student Representative in SNU Astronomy Department
2017	Teaching Assistant , Computational Astronomy
2016	Teaching Assistant , Introduction to Astrophysics

June 9, 2025