Sanghyuk Moon | Curriculum Vitae

Postdoctoral Research Associate
Department of Astrophysical Sciences
Princeton University, Princeton, NJ 08544, USA
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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-OBC`: 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

Accepted **Moon, S.** and Ostriker, E. C. Prestellar Cores in Turbulent Clouds: Observational Perspectives on Structure, Kinematics, and Lifetime. *Accepted for publication in ApJ*

07/2025 **Moon, S.** and Ostriker, E. C. (2025) Prestellar Cores in Turbulent Clouds: Properties of Critical Cores. *ApJ*, 988, 82

07/2025 **Moon, S.** and Ostriker, E. C. (2025) Prestellar Cores in Turbulent Clouds: Numerical Modeling and Evolution to Collapse. *ApJ*, 987, 78

11/2024 **Moon, S.** and Ostriker, E. C. (2024). Theory of Turbulent Equilibrium Spheres with Power-law Linewidth–Size Relation. *ApJ*, 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. *MNRAS*, 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. *ApJ*, 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. *ApJ*, 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. *ApJ*, 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. *ApJS*, 241, 24.

09/2016 Kim, W.-T. and **Moon, S.** (2016). Equilibrium Sequences and Gravitational Instability of Rotating Isothermal Rings. *ApJ*, 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**, *Origins Workshop*, Salt Lake City, USA (*virtual*)
11/2021	**Seminar**, Heidelberg Univ., Germany (*virtual*)
11/2021	**Seminar**, Center for Computational Astrophysics, New York, USA (*virtual*)
10/2021	**Contributed Talk**, *KAS Fall Meeting*, Jeju, Korea
04/2021	**Contributed Talk**, *KAS Spring Meeting* (*virtual*)
01/2021	**Workshop**, *2nd Numerical Galaxy Formation Mini-Workshop*, Seoul, Korea (*virtual*)
01/2020	**Workshop**, *Numerical Galaxy Formation Mini-Workshop*, Seoul, Korea

Professional Services and Teaching Experience

2024–present	**Referee**, The Astrophysical Journal
2024–present	**Referee**, Astronomische Nachrichten
2022–2025	**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

September 18, 2025