Sanghyuk Moon | Curriculum Vitae

Astronomy Program, Department of Physics & Astronomy
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Education

06/2022 (expected) **Ph.D in Astronomy**, Seoul National University, Korea
Advisor: Woong-Tae Kim

06/2016 **B.S. in Astronomy (minor: physics)**, Seoul National University, Korea

Honors and Awards

2017–2022 **Global Ph.D. Fellowship** (Sallary obtained from NRF: \$26,000/*yr*)
Dynamical Evolution and Star Formation in Central Molecular Zones

2016–2017 **Lecture & Research Scholarship**

2015 **National Scholarship for Science and Engineering**

2014 **SNU Development Fund Scholarship**

2013 **ASAN foundation Scholarship**

Code Development Contributions

2021–present Core developer of `TIGRIS` project (PI: Chang-Goo Kim)
Self-gravity with shearing-periodic, open, and mixed boundary conditions in `Athena++`

2018–2019 Poisson solver with open boundary conditions for Cartesian and cylindrical grids in `Athena++`
Used in Mullen & Gammie (2020), Baehr et al. (in prep.)

Publications

1. Refereed Journals

Published **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*, 9–32. http://dx.doi.org/10.3847/1538-4357/abfa93

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*, 24–43. http://dx.doi.org/10.3847/1538-4365/ab09e9

Kim, W.-T. and **Moon, S.** (2016). Equilibrium Sequences and Gravitational Instability of Rotating Isothermal Rings. *The Astrophysical Journal, 829*, 45–66. http://dx.doi.org/10.3847/0004-637X/829/1/45

Submitted **Moon, S.**, Kim, W.-T., Kim, C.-G., and Ostriker, E. C. (in press). Effects of Varying Mass Inflows on Star Formation in Nuclear Rings of Barred Galaxies. *The Astrophysical Journal*. https://arxiv.org/abs/2110.14882

In Preparation **Moon, S.**, Kim, W.-T., Kim, C.-G., and Ostriker, E. C. (2021). *Effects of Magnetic Fields on Star Formation in Nuclear Rings of Barred Galaxies*. Manuscript in preparation.

2. Proceedings

Published — **Moon, S.** (2020). Three-Dimensional Cylindrical Poisson Solver with Vacuum Boundary Conditions. *Journal of Physics: Conference Series, 1623(1)*, 012017. http://dx.doi.org/10.1088/1742-6596/1623/1/012017

Presentations

01/2022 — **Contributed Talk**, 239th AAS Meeting, Salt Lake City, USA (*scheduled*)

11/2021 — **Seminar**, Internal Group Meeting, Heidelberg, Germany

11/2021 — **Seminar**, CCA Group Meeting, New York, USA

10/2021 — **Contributed Talk**, 2021 KAS Fall Meeting, Seoul, Korea

04/2021 — **Contributed Talk**, 2021 KAS Spring Meeting, Seoul, Korea

01/2021 — **Workshop Talk**, 2nd Numerical Galaxy Formation Mini-Workshop, Seoul, Korea

01/2020 — **Workshop Talk**, Numerical Galaxy Formation Mini-Workshop, Seoul, Korea

11/2019 — **Invited Seminar**, Star Formation/ISM Rendezvous (SFIR), Princeton, USA

07/2019 — **Invited Talk**, ASTRONUM 2019, Paris, France

04/2019 — **Contributed Talk**, 2019 KAS Spring Meeting, Seoul, Korea

03/2019 — **Invited Talk**, ATHENA++ workshop 2019, Las Vegas, USA

10/2016 — **Poster**, 2016 KAS Fall Meeting, Seoul, Korea

Research Experience

10/2019–12/2019 — **Princeton University** (two months; *Mentor*: Prof. Eve C. Ostriker)
Visiting Student Research Collaborator

01/2019–01/2019 — **Princeton University** (two weeks; *Mentor*: Prof. Eve C. Ostriker)

07/2018–08/2018 — **Princeton University** (two weeks; *Mentor*: Prof. Eve C. Ostriker)

12/2017–12/2017 — **Osaka University** (four days; *Mentor*: Prof. Kengo Tomida)

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

Computing skills

Language — C/C++, MPI, OpenMP, Python, Bash, HTML

CFD codes — Athena, Athena++, GIZMO

Other tools — GDB, Valgrind, Git, Jupyter, yt, pynbody, VisIt

Departmental Services and Teaching Experience

2021–*present*	**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
2017	President of Graduate Students in SNU Astronomy Department
2017	**Teaching Assistant**, Computational Astronomy
2016	**Teaching Assistant**, Introduction to Astrophysics

Academic References

- **Prof. Woong-Tae Kim**
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  Seoul National University
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- **Prof. Bon-Chul Koo**
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- **Prof. Eve C. Ostriker**
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