

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** (Salary 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++
Algorithm development and MPI-parallel implementation.

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 **Seminar**, TAG Special Seminar, KASI, Daejeon, Korea (invited)
01/2022 **Invited Talk**, Origins Workshop, Salt Lake City, USA
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 **Seminar**, Star Formation/ISM Rendezvous, Princeton, USA (invited)
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– <i>present</i>	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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