

# Sanghyuk Moon | Curriculum Vitae

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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>
- 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, 99–109. <http://dx.doi.org/10.3847/1538-4357/ac3a7b>

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**, 2nd Numerical Galaxy Formation Mini-Workshop, Seoul, Korea  
01/2020      **Workshop**, 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** ( $1.4 \times 10^7$  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** ( $2.0 \times 10^7$  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>	<b>Founder and Organizer</b> , SNU Astronomy Graduate Student Journal Club
2019	<b>Founding Member</b> , SNU Open Astronomy Innovation Group
2018–2019	<b>Founder and Organizer</b> , SNU Astronomy Graduate Student Colloquium
2017	President of Graduate Students in SNU Astronomy Department
2017	<b>Teaching Assistant</b> , Computational Astronomy
2016	<b>Teaching Assistant</b> , Introduction to Astrophysics

## Academic References

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| <ul style="list-style-type: none"><li>• <b>Prof. Woong-Tae Kim</b><br/><a href="mailto:wkim@astro.snu.ac.kr">wkim@astro.snu.ac.kr</a><br/>Department of Physics and Astronomy<br/>Seoul National University<br/>+82-2-880-6769</li></ul> | <ul style="list-style-type: none"><li>• <b>Prof. Eve C. Ostriker</b><br/><a href="mailto:eco@astro.princeton.edu">eco@astro.princeton.edu</a><br/>Department of Astrophysical Sciences<br/>Princeton University<br/>+1-609-258-7240</li></ul> |
| <ul style="list-style-type: none"><li>• <b>Prof. Bon-Chul Koo</b><br/><a href="mailto:koo@astro.snu.ac.kr">koo@astro.snu.ac.kr</a><br/>Department of Physics and Astronomy<br/>Seoul National University<br/>+82-2-880-6623</li></ul>    |   |