

Jeong-Gyu Kim | Curriculum Vitae

Theoretical Astronomy Department, Lee Wonchul Hall
776, Daedeokdae-ro, Yuseong-gu, Daejeon 34055, Republic of Korea
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Employment

EACOA Fellow

Korea Astronomy and Space Science Institute

Dajeon, Korea

10/2021–present

Lyman Spitzer, Jr. Postdoctoral Fellow

Department of Astrophysical Sciences, Princeton University

Princeton, NJ, USA

09/2018–08/2021

Education and Research Experience

Seoul National University

Ph.D. in Astronomy

Advisor: Prof. Woong-Tae Kim

*Thesis Title: Dynamical Evolution of Giant Molecular Clouds Driven by
UV Radiation Feedback from Massive Stars*

Seoul, Korea

08/2018

M.S. in Astronomy

02/2012

B.S. in Astronomy

02/2010

Princeton University

Visiting Student Research Collaborator

Mentor: Prof. Eve Ostriker

Princeton, NJ, USA

2014–2016 (2mo/yr)

Honors

EACOA Fellowship

East Asian Core Observatory Association

2021–2024

Lyman Spitzer, Jr. Fellowship

Princeton University

2018–2021

Outstanding Thesis Award

College of Natural Sciences, Seoul National University

2018

National Junior Research Fellowship (Grants obtained as PI: \$41,300/yr)

National Research Foundation of Korea

2014–2018

Project name: “Expansion of Dusty Magnetized H II Regions and Their Dynamic Impact on the Interstellar Medium”

SNU Fellowship for the Next Generation of Basic Research

Seoul National University

2013

Scholarship for Superior Academic Performance

Brain Korea 21

2012

Lotte Scholarship

Full tuition awarded by Lotte Foundation

2010–2011

National Scholarship For Science and Engineering

Full tuition awarded by National Research Foundation of Korea

2003–2004, 2008–2009

Research Interests

Stellar feedback, lifecycle of molecular clouds, formation of star clusters, dynamics and thermodynamics of the interstellar medium, galactic star formation and outflows

Publications

Journal Publications – ADS Search.....

Led by a student under direct supervision

16. *Slow Star Formation in the Milky Way: Theory Meets Observations*
Evans, Neal J., II, **Kim, J.-G.**, & Ostriker, E. C. 2022, ApJL in press
15. *Star Formation Regulation and Self-Pollution by Stellar Wind Feedback*
Lancaster, L., Ostriker, E. C., **Kim, J.-G.**, & Kim, C.-G. 2021, ApJL, 922, 3L
14. *Efficiently Cooled Stellar Wind Bubbles in Turbulent Clouds: II. Validation of Theory with Hydrodynamic Simulations*
Lancaster, L., Ostriker, E. C., **Kim, J.-G.**, & Kim, C.-G. 2021, ApJ, 914, 90L
13. *Efficiently Cooled Stellar Wind Bubbles in Turbulent Clouds: I. Fractal Theory and Application to Star-Forming Clouds*
Lancaster, L., Ostriker, E. C., **Kim, J.-G.**, & Kim, C.-G., 2021, ApJ, 914, 89L
12. *Star Formation Efficiency and Dispersal of Giant Molecular Clouds with UV Radiation Feedback: Dependence on Gravitational Boundedness and Magnetic Fields*
Kim, J.-G., Ostriker, E. C., & Filippova, N. 2021, ApJ, 911, 128K
11. *The environmental dependence of the X_{CO} conversion factor*
Gong, M., Ostriker, E. C., Kim, C.-G., & **Kim, J.-G.** 2020, ApJ, 903, 142
10. *Factories of CO-dark gas: molecular clouds with limited star formation efficiencies by far-ultraviolet feedback*
Inoguchi, M., Hosokawa, T., Mineshige, S., & **Kim, J.-G.** 2020, MNRAS, 497, 5061I
9. *# Diffuse Ionized Gas in Simulations of Multiphase, Star-forming Galactic Disks*
Kado-Fong, E., **Kim, J.-G.**, Ostriker, E. C., & Kim, C.-G. 2020, ApJ, 897, 143
8. *Modeling UV Radiative Feedback from Massive Stars: III. Escape of Radiation from Star-Forming Giant Molecular Clouds*
Kim, J.-G., Kim, W.-T., & Ostriker, E. C. 2019, ApJ, 883, 102
7. *Modeling UV Radiative Feedback from Massive Stars: II. Dispersal of Star-Forming Giant Molecular Clouds by Photoionization and Radiation Pressure*
Kim, J.-G., Kim, W.-T., & Ostriker, E. C. 2018, ApJ, 859, 68

6. *Modeling UV Radiative Feedback from Massive Stars: I. Implementation of Adaptive Ray Tracing Method and Tests*
Kim, J.-G., Kim, W.-T., Ostriker, E. C., & Skinner A. M. 2017, ApJ, 851, 93
5. *Disruption of Molecular Clouds by Expansion of Dusty H II Regions*
Kim, J.-G., Kim, W.-T., & Ostriker, E. C. 2016, ApJ, 819, 137
4. *Instability of Magnetized Ionization Fronts Surrounding H II regions*
Kim, J.-G., Kim, W.-T. 2014, ApJ, 797, 135
3. *Nature of Wiggle Instability of Galactic Spiral Shocks*
Kim, W.-T., Kim, Y., & **Kim, J.-G.** 2014, ApJ, 789, 68
2. *Instability of Evaporation Fronts in the Interstellar Medium*
Kim, J.-G., Kim, W.-T. 2013, ApJ, 779, 48
1. *Gravitational Instability of Rotating, Pressure-Confined, Polytropic Gas Disks with Vertical Stratification*
Kim, J.-G., Kim, W.-T., Seo Y. M., & Hong, S. S. 2012, ApJ, 761, 131

Selected Conferences and Talks

- **Invited Talk**, *Modeling photochemistry and heating/cooling of the ISM with UV radiative transfer*
Breakthroughs in Galaxy Formation, Rinberg Castle, Germany, Apr 6, 2022
- **Contributed Talk**, *Star Formation Efficiency and Destruction of Giant Molecular Clouds with UV Radiation Feedback*, The 1st VARNET Workshop on Star Formation and Stellar Feedback, Dec 9, 2021
- **Invited Colloquium**, *Star Formation Efficiency and Destruction of Giant Molecular Clouds with UV Radiation Feedback*, KASI, Daejeon, Korea, Nov 24, 2021
- **Invited Talk**, *Modeling ISM Thermochemistry Coupled with UV Radiative Transfer*
Center for Computational Astrophysics, Flatiron Institute, NY, USA, Jun 21, 2021
- **Invited Seminar**, *Modeling Dispersal of Molecular Clouds by UV Radiation Feedback*
CCAPP (Zoom) Seminar, Ohio State University, OH, USA, Nov 24, 2020
- **Invited Seminar**, *Modeling Dispersal of Molecular Clouds by UV Radiation Feedback*
Thunch (Zoom) Seminar, Princeton University, NJ, USA, Nov 12, 2020
- **Invited Seminar**, *Modeling Dispersal of Molecular Clouds by UV Radiation Feedback*
Astronomy (Zoom) Seminar, University of Kentucky, KY, USA, Oct 29, 2020
- **Invited Talk**, *Modeling Dispersal of Molecular Clouds by UV Radiation Feedback*
Ringberg Workshop on Computational Galaxy Formation, Tegernsee, Germany, Apr 20, 2020
(Cancelled due to COVID-19)
- **Invited Review**, *Numerical Modeling of Warm Ionized Medium: A Large-scale Perspective*
WIM in Galaxies Workshop, Green Bank Observatory, WV, USA, Oct 8, 2019
- **Contributed Talk**, *Modeling UV Radiation Feedback from Massive Stars*
The Self-organized Star Formation Process, Institut Pascal, Orsay, France, Sep 30, 2019

- **Special Seminar**, *Modeling UV Radiation Feedback from Massive Stars*
Korea Astronomy and Space Science Institute, Daejeon, South Korea, Aug 29, 2019
- **Special Colloquium**, *Modeling UV Radiation Feedback from Massive Stars*
Max Planck Institute for Radio Astronomy, Bonn, Germany, Jul 3, 2019
- **Contributed Talk**, *Diffuse Ionized Gas in TIGRESS Simulations of the ISM*
European Week of Astronomy & Space Science 2019, Lyon, France, Jun 27, 2019
- **Contributed Talk**, *Dispersal of GMCs by UV Radiation Feedback from Massive Stars*
Zooming in on Star Formation, Nafplio, Greece, Jun 13, 2019
- **Invited Talk**, *Adaptive Ray Tracing in Athena*
Athena++ Workshop 2019, Las Vegas, USA, Mar 18–22, 2019
- **Poster**, *Modeling UV Radiation Feedback from Massive Stars: Dispersal of GMCs and Escape of Radiation*
van de Hulst Centennial Symposium: The interstellar Medium of Galaxies: Status and Future Perspectives, Leiden, the Netherlands, Nov 5–9, 2018
- **Poster**, *Dispersal of Giant Molecular Clouds by UV Radiation Feedback from Massive Stars*
15th Potsdam Thinkshop: The role of feedback in galaxy formation: from small-scale winds to large-scale outflows, Potsdam, Germany, Sep 3–7, 2018
- **Poster**, *Dispersal of Giant Molecular Clouds by Photoionization and Radiation Pressure*
231st AAS Meeting, Washington D.C., USA, Jan 11, 2018
- **Invited Colloquium**, *Dispersal of Giant Molecular Clouds by Photoionization and Radiation Pressure*
Osaka University, Japan, Dec 21, 2017
- **Contributed Talk**, *Dispersal of Molecular Clouds by Photoionization and Radiation Pressure*
Star Formation in Different Environments, Quy Nhon, Vietnam, Aug 7, 2017
- **Seminar Talk**, *Modeling Radiative Feedback from Massive Stars*
Star Formation/ISM Rendezvous, Princeton University, USA, Nov 28, 2016
- **Contributed Talk**, *Modeling Radiative Feedback from Massive Stars: Implementation of Adaptive Ray Tracing Method into the Athena Code*
ASTRONUM 2016, Monterey, USA, Jun 8, 2016

Advising Experience

- **Nora Linzer**, Princeton PhD student, *Interstellar UV radiation field in TIGRESS simulations* (semester project), co-advised with Prof. Eve Ostriker and Dr. Chang-Goo Kim, 2021–present
- **Lachlan Lancaster**, Princeton PhD student, *Stellar Wind Bubble Expansion in the Turbulent ISM* (thesis project), co-advised with Prof. Eve Ostriker and Dr. Chang-Goo Kim, 2019–present
- **Erin Kado-Fong**, Princeton PhD student, *Diffuse Ionized Gas in Simulations of Multiphase, Star-forming Galactic Disks* (semester project), co-advised with Prof. Eve Ostriker and Dr. Chang-Goo Kim, 2018–2020

- **Nina Filippova**, Princeton undergraduate, *Numerical Magnetohydrodynamics Simulations of Star Formation and Giant Molecular Cloud Destruction* (senior thesis), co-advised with Prof. Eve Ostriker, 2019–2020

Teaching Experience

- *Man and the Universe* (non-major course), Teaching Assistant for Prof. Jonghak Woo, Fall 2012
- *Observational Astronomy*, Teaching Assistant for Prof. Jonghak Woo, Spring 2012
- Part-time lecturer for An Introduction to IDL Programming for Undergraduates, Feb 2014

Competitively-Obtained Computing Time

Co-I (Science PI), 1.6 M CPU-hrs on KISTI Tachyon2,
“Galactic Star Formation and Outflows Regulated by UV Radiation and Supernova Feedback”, 2017

Co-I (Science PI), 1.2 M CPU-hrs on KISTI Tachyon2,
“Expansion of Dusty H II Regions and Its Dynamical Impact on the Interstellar Medium”, 2016

Computer Skills

Programming Language: C/C++, MPI, Python, IDL

Visualization/Software: DDT, GDB, Git, yt, VisIt, ParaView

Simulation Code: *Athena* / *Athena++*

Other Experience

Journal referee: ApJ, MNRAS

Military Service: Weather observer in the Republic of Korea Air Force, 2005-2007

Departmental Service:

- SNU Astronomy Journal Club Coordinator, 2011–2013
- Lead editor of *A quick guide to SNU astro graduate students.*, 2014
- Volunteered multiple times for Astronomy Open House, 2010–2014

Academic References

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| ◦ Prof. Woong-Tae Kim wkim@astro.snu.ac.kr Department of Physics and Astronomy Seoul National University +82-2-880-6769 | ◦ Prof. Eve C. Ostriker eco@astro.princeton.edu Department of Astrophysical Sciences Princeton University +1-609-258-7240 |
| ◦ Prof. Takashi Hosokawa hosokawa@tap.scphys.kyoto-u.ac.jp Department of Physics Kyoto University +81-75-753-3840 | ◦ Prof. Thiem Hoang thiemhoang@kasi.re.kr Theoretical Astrophysics Group Korea Astronomy and Space Science Institute +82-42-865-3343 |