Jeong-Gyu Kim | Curriculum Vitae

Division of Science – 2-21-1, Osawa, Mitaka, Tokyo 181-0015 Japan
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Employment

EACOA Fellow — **Mitaka, Tokyo, Japan**
National Astronomical Observatory of Japan — *10/2022–present*

EACOA Fellow — **Daejeon, Korea**
Korea Astronomy and Space Science Institute — *10/2021–09/2022*

Lyman Spitzer, Jr. Postdoctoral Fellow — **Princeton, NJ, USA**
Department of Astrophysical Sciences, Princeton University — *09/2018–08/2021*

Education and Research Experience

Seoul National University — **Seoul, Korea**
Ph.D. in Astronomy — *08/2018*
Advisor: Prof. Woong-Tae Kim
Thesis Title: Dynamical Evolution of Giant Molecular Clouds Driven by UV Radiation Feedback from Massive Stars

M.S. in Astronomy — *02/2012*

B.S. in Astronomy — *02/2010*

Princeton University — **Princeton, NJ, USA**
Visiting Student Research Collaborator — *2014–2016 (2mo/yr)*
Mentor: Prof. Eve Ostriker

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, star formation, lifecycle of molecular clouds, dynamics and thermodynamics of the interstellar medium, physics of grain alignment

Advising Experience

- **Nguyen Chau Giang**, PhD student in University of Science & Technology, *Modeling Polarized Thermal Emission from Dust Grains in Protostellar Cores* (PhD Project), co-advised with Prof. Thiem Hoang, 2021–present
- **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, 2019–2022
- **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

Publications

Journal Publications – ADS Search

Led by a student under direct supervision

20. *Implementation of Chemistry in the Athena++ Code*
Gong, M. et al. (incl. **JGK**), ApJ submitted
19. *Physical Modeling of Dust Polarization from Magnetically Enhanced Radiative Torque (MRAT) Alignment in Protostellar Cores with POLARIS*
Giang, N. C., Hoang, T., **Kim, J.-G.**, & Tram, L. N. 2023, MNRAS, 520, 3788
18. *Introducing TIGRESS-NCR: I. Co-regulation of Multiphase ISM and Star Formation Rates*
Kim, C.-G., **Kim, J.-G.**, Gong, M., & Ostriker, E. C. 2023, ApJ, 946, 3
17. *Photochemistry and Heating/Cooling of the Multiphase Interstellar Medium with UV Radiative Transfer in Magnetohydrodynamic Simulations*
Kim, J.-G., Gong, M., Kim, C.-G., & Ostriker, E. C. 2023, ApJS, 264, 10

16. *Slow Star Formation in the Milky Way: Theory Meets Observations*
Evans, Neal J., II, **Kim, J.-G.**, & Ostriker, E. C. 2022, ApJL, 929L, 18E
15. *Star Formation Regulation and Self-Pollution by Stellar Wind Feedback*
Lancaster, L., Ostriker, E. C., **Kim, J.-G.**, & Kim, C.-G. 2021, ApJL, 922L, 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 (2016-present)

- **Invited Colloquium**, Osaka Univ., Osaka, Japan, May, 2023
- **Talk**, Athena++ Workshop 2023, Center for Computational Astrophysics, New York, USA, May, 2023
- **Contributed Talk**, Workshop on Star Formation: From Clouds to Cores, NAOJ, Mitaka, Japan, Apr, 2023
- **Poster**, Protostars and Planets VII, Kyoto, Japan, Apr, 2023
- **Invited Colloquium**, Kyungpook Nat'l Univ., Daegu, Korea, Apr, 2023
- **Contributed Talk**, DARWIN+Numerical Galaxy Formation Joint Workshop, Konjiam, Korea, Jan, 2023
- **Contributed Talk**, Recent Advances in Galaxy Formation and Reionization 2022, Yonsei Univ., Seoul, Korea, Nov, 2022
- **Invited Colloquim**, NAOJ, Mitaka, Japan, Oct, 2022
- **Invited Colloquim**, Seoul Nat'l Univ., Seoul, Korea, Sep, 2022
- **Contributed Talk**, IAU Symposium 373: Resolving the Rise and Fall of Star Formation in Galaxies, Busan, Korea, Aug, 2022
- **Invited Colloquim**, Yonsei Univ. (online), Seoul, Korea, Apr, 2022
- **Invited Colloquim**, Chungnam Nat'l Univ., Daejeon, Korea, Apr, 2022
- **Contributed Talk**, KAS Spring Meeting, Busan, Korea, Apr, 2022
- **Invited Talk**, Breakthroughs in Galaxy Formation, Ringberg Castle, Germany, Apr, 2022
- **Seminar Talk**, Theoretical Astrophysics Group Seminar, KASI, Daejeon, Korea, Mar, 2022
- **Contributed Talk**, The 1st VARNET Workshop on Star Formation and Stellar Feedback (online), Dec, 2021
- **Invited Colloquium**, KASI, Daejeon, Korea, Nov, 2021
- **Invited Seminar**, CCAPP Seminar (online), Ohio State University, OH, USA, Nov, 2020
- **Invited Seminar**, Thunch Seminar (online), Princeton University, NJ, USA, Nov, 2020
- **Invited Seminar**, Astronomy Seminar (zoom), University of Kentucky, KY, USA, Oct, 2020
- **Invited Review**, WIM in Galaxies Workshop, Green Bank Observatory, WV, USA, Oct, 2019
- **Contributed Talk**, The Self-organized Star Formation Process, Institut Pascal, Orsay, France, Sep, 2019
- **Special Seminar**, KASI, Daejeon, Korea, Aug, 2019
- **Special Colloquium**, Max Planck Institute for Radio Astronomy, Bonn, Germany, Jul, 2019
- **Contributed Talk**, European Week of Astronomy & Space Science 2019, Lyon, France, Jun, 2019
- **Contributed Talk**, Zooming in on Star Formation, Nafplio, Greece, Jun, 2019

- **Invited Talk**, Athena++ Workshop 2019, Las Vegas, USA, Mar, 2019
- **Poster**, van de Hulst Centennial Symposium Leiden, the Netherlands, Nov, 2018
- **Poster**, 15th Potsdam Thinkshop Potsdam, Germany, Sep, 2018
- **Poster**, 231st AAS Meeting, Washington D.C., USA, Jan, 2018
- **Invited Colloquium**, Osaka University, Japan, Dec, 2017
- **Contributed Talk**, Star Formation in Different Environments, Quy Nhon, Vietnam, Aug, 2017
- **Seminar Talk**, Star Formation/ISM Rendezvous, Princeton University, USA, Nov, 2016
- **Poster**, Star Formation 2016, Exeter, UK, Aug, 2016
- **Contributed Talk**, ASTRONUM 2016 11th Annual International Conference on Numerical Modeling of Space Plasma Flows, Monterey, USA, Jun, 2016

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

Other Experience

K-GMT Time Allocation Committee: 2021-present

Journal referee (ApJ and MNRAS): 2020-present

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

Departmental Service:

- KASI TAG Seminar Organizer, 2022–present
- SNU Astronomy Journal Club Coordinator, 2011–2013
- Lead editor of *A quick guide to SNU astro graduate students.*, 2014
- Volunteered multiple times for SNU Astronomy Open House, 2010–2014

Academic References

- **Prof. Eve C. Ostriker**
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- **Prof. Woong-Tae Kim**
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