Curriculum Vitae

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Current Position

Sep 2018 – **Associate Research Scholar**
Department of Astrophysical Sciences, Princeton University

Employment

Sep 2017 – Aug 2018 **Flatiron Research Fellow**
Center for Computational Astrophysics (CCA), Flatiron Institute

Sep 2016 – Aug 2017 **Associate Research Scholar**
Department of Astrophysical Sciences, Princeton University

Sep 2013 – Aug 2016 **Postdoctoral Research Associate**
Department of Astrophysical Sciences, Princeton University

Oct 2011 – Aug 2013 **CITA National Fellow**
Department of Physics and Astronomy, University of Western Ontario, Canada

Mar 2011 – Aug 2011 **BK21 Postdoctoral Research Fellow**
Department of Physics and Astronomy, Seoul National University, Korea

Education

Mar 2005– Feb 2011 **Ph. D in Astronomy**
Department of Physics and Astronomy, Seoul National University, Korea

Mar 2001– Feb 2005 **B. S in Astronomy**
Department of Physics and Astronomy, Seoul National University, Korea

Teaching Experience

2018 **Erin Kado-Fong,** Graduate student at Princeton University
Semester project in Princeton University (with Eve Ostriker, Jeong-Gyu Kim)

2018 **Kareem El-Badry,** Graduate student at the UC Berkeley
Summer research via Kavli Summer Program in Astrophysics (with Eve Ostriker)

2018 **Aditi Vijayan,** Graduate student at the Indian Institute of Science
Summer research via Kavli Summer Program in Astrophysics (with Eve Ostriker, Lucia Armillotta, Miao Li)

2018 **Mohammad Refat,** Undergraduate student at the CUNY
Summer research via AstroCom NYC

2018 **Erin Flowers,** Graduate student at Princeton University
Semester project in Princeton University (with Eve Ostriker)

2017 – **Woorak Choi,** Graduate student at Yonsei University
Ph.D thesis project (with Aeree Chung)

2014 – 2015 **Roberta Raileanu,** Undergraduate student at Princeton University
Junior Thesis and Summer research (with Eve Ostriker)

2005 – 2010 **Teaching Assistant,** Seoul National University
Grading problem sets and leading problem-solving sessions for courses including *Solar System Astronomy and Lab., Astronomical Observation & Lab. I & II, Astronomy and Lab., Introduction to Astrophysics I & II, Stars and Stellar Systems, Man & the Universe.*
Designing and leading the Lab classes.
Teaching programming languages and analysis tools including Fortran, C, and IDL.

Grants/Computing Time Allocations

2019 **PI**, Hubble Theory Grant (in prep)
2019 **PI**, Chandra Theory Grant (submitted)
2019 **60M CPU hrs, Co-I**, ASCR Leadership Computing Challenge (submitted; PI: Alex Lazarian)
2019 **20M CPU hrs, Co-I**, NERSC, (PI: Julian Borrill)
2019 **6M CPU hrs (750k SBUs), Co-I**, NASA Pleiades, (PI: Eve Ostriker)
2018–2021 **Co-I**, NASA TCAN (PI: Julian Borrill)
2018 **20M CPU hrs, Co-I**, NERSC, (PI: Julian Borrill)
2018 **PI**, Chandra Theory Grant (not selected)
2018 **6M CPU hrs (750k SBUs), Co-I**, NASA Pleiades, (PI: Eve Ostriker)
2017 **6M CPU hrs (750k SBUs), Co-I**, NASA Pleiades, (PI: Eve Ostriker)
2016 **6M CPU hrs (750k SBUs), Co-I**, NASA Pleiades, (PI: Eve Ostriker)

Professional Activities and Services

2018 – 2021 **Subnet Leader,** NASA TCAN
Modeling Polarized Galactic Foregrounds for CMB Missions; multi-institutional collaboration funded by NASA

2017 – 2022 **Working Group Leader,** SMAUG collaboration
Simulating Multi-scale Astrophysics to Understand Galaxies; an international collaboration to build the next-generation galaxy formation theory funded by the Simons Foundation

2017 – 2019 **Member,** PICO collaboration
Probe of Inflation and Cosmic Origins; a concept study for a probe mission funded by NASA

2017 **Review Panelist**, NSF AAG Program
2016 – 2017 **Organizer**, Star Formation/ISM Rendezvous Seminars at Princeton University
2012 – **Referee**, ApJ, ApJL, MNRAS

Colloquia and Conferences (Last three years)

2019 **Colloquium**, University of Maryland, College Park, MD
2019 **Colloquium**, Australia National University, Canberra, Austrailia
2019 **Invited Review**, Australia-ESO joint conference, Sydney, Australia
2019 **Invited Talk**, Multi-phase Gas Workshop, CCA, New York, NY
2018 **Invited Talk/Long Term Participant**, The Milky Way in the age of Gaia, Orsay, France
2018 **Contributed Talk**, THINKSHOP15, Potsdam, Germany
2018 **Colloquium**, Yonsei University, Seoul, Korea
2018 **Colloquium**, KASI, Daejeon, Korea
2018 **Invited Talk/Mentor**, Kavli Summer Program in Astrophysics, New York, NY
2018 **Invited Talk**, MPPC Workshop, Princeton, NJ
2018 **Invited Talk**, CMB Foreground Workshop CCA, New York, NY
2018 **Invited Talk**, Computational Galaxy Formation at Ringberg Castle, Germany
2017 **Invited Talk**, CMB Foreground Workshop at UCSD, San Diego, CA
2017 **Invited Talk/Long Term Participant**, The ISM beyond 3D, Orsay, France
2017 **Colloquium**, Theoretical Astrophysics Group, Osaka, Japan
2017 **Invited Talk**, Astrophysics Seminar, UCSB, Santa Barbara, CA
2017 **Colloquium**, UCSB, Santa Barbara, CA
2016 **Colloquium**, Shanghai Jiao Tong University, Shanghai, China
2016 **Invited Talk**, 7th East-Asia Numerical Astrophysics Meeting, Beijing, China
2016 **Colloquium**, KASI, Daejeon, Korea
2016 **Colloquium**, Seoul National University, Seoul, Korea
2016 **Invited Talk**, How Galaxies Form Stars, Stockholm, Sweden
2016 **Invited Talk**, Computational Galaxy Formation at Ringberg Castle, Germany

References

Eve Ostriker – eco@astro.princeton.edu, +1-609-258-7240
Professor, Department of Astrophysical Sciences, Princeton University

James Stone – jmstone@astro.princeton.edu, +1-609-258-3815
Chair & Professor, Department of Astrophysical Sciences, Princeton University

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Professor, Department of Astronomy, University of Wisconsin-Madison

Rachel Somerville – rsomerville@flatironinstitute.org, +1-848-445-8964
Group Leader, Center for Computational Astrophysics, Flatiron Institute
Professor, Department of Physics and Astronomy, Rutgers University

Additional letters are available upon request – Woong-Tae Kim (Seoul National University, thesis advisor), Greg Bryan (CCA/Columbia), David Spergel (CCA/Princeton), Shantanu Basu (Western) Amiel Sternberg (Tel Aviv/CCA)

Bibliography

** student primary mentored by me

Refereed Publications

1. C. E. Murray, S. Stanimirović, W. M. Goss, C. Heiles, J. M. Dickey, B. Babler, and **Chang-Goo Kim**, October 2018, ApJS, 238:14, *The 21-SPONGE H I Absorption Line Survey. I. The Temperature of Galactic H I.*
2. M. Gong, E. C. Ostriker, and **Chang-Goo Kim**, May 2018, ApJ, 858:16, *The X_{CO} Conversion Factor from Galactic Multiphase ISM Simulations.*
3. **Chang-Goo Kim** and E. C. Ostriker, February 2018, ApJ, 853:173, *Numerical Simulations of Multiphase Winds and Fountains from Star-forming Galactic Disks. I. Solar Neighborhood TIGRESS Model.*
4. **Chang-Goo Kim** and E. C. Ostriker, September 2017, ApJ, 846:133, *Three-phase Interstellar Medium in Galaxies Resolving Evolution with Star Formation and Supernova Feedback (TIGRESS): Algorithms, Fiducial Model, and Convergence.*
5. C. E. Murray, S. Stanimirović, **Chang-Goo Kim**, E. C. Ostriker, R. R. Lindner, C. Heiles, J. M. Dickey, and B. Babler, March 2017, ApJ, 837:55, *Recovering Interstellar Gas Properties with Hi Spectral Lines: A Comparison between Synthetic Spectra and 21-SPONGE.*
6. C. Safranek-Shrader, M. R. Krumholz, **Chang-Goo Kim**, E. C. Ostriker, R. I. Klein, S. Li, C. F. McKee, and J. M. Stone, February 2017, MNRAS, 465:885–905, *Chemistry and radiative shielding in star-forming galactic discs.*
7. **Chang-Goo Kim**, E. C. Ostriker, and R. Raileanu**, January 2017, ApJ, 834:25, *Superbubbles in the Multiphase ISM and the Loading of Galactic Winds.*
8. **Chang-Goo Kim** and E. C. Ostriker, December 2015, ApJ, 815:67, *Vertical Equilibrium, Energetics, and Star Formation Rates in Magnetized Galactic Disks Regulated by Momentum Feedback from Supernovae.*
9. **Chang-Goo Kim** and E. C. Ostriker, April 2015, ApJ, 802:99, *Momentum Injection by Supernovae in the Interstellar Medium.*
10. **Chang-Goo Kim**, E. C. Ostriker, and W.-T. Kim, May 2014, ApJ, 786:64, *Three-dimensional Hydrodynamic Simulations of Multiphase Galactic Disks with Star Formation Feedback. II. Synthetic H I 21 cm Line Observations.*
11. **Chang-Goo Kim** and S. Basu, December 2013, ApJ, 778:88, *Long-term Evolution of Decaying Magnetohydrodynamic Turbulence in the Multiphase Interstellar Medium.*
12. **Chang-Goo Kim**, E. C. Ostriker, and W.-T. Kim, October 2013, ApJ, 776:1, *Three-dimensional Hydrodynamic Simulations of Multiphase Galactic Disks with Star Formation Feedback. I. Regulation of Star Formation Rates.*
13. **Chang-Goo Kim**, W.-T. Kim, and E. C. Ostriker, December 2011, ApJ, 743:25, *Regulation of Star Formation Rates in Multiphase Galactic Disks: Numerical Tests of the Thermal/Dynamical Equilibrium Model.*
14. **Chang-Goo Kim**, W.-T. Kim, and E. C. Ostriker, September 2010, ApJ, 720:1454–1471, *Galactic Spiral Shocks with Thermal Instability in Vertically Stratified Galactic Disks.*

15. **Chang-Goo Kim**, W.-T. Kim, and E. C. Ostriker, July 2008, ApJ, 681:1148–1162, *Galactic Spiral Shocks with Thermal Instability.*
16. **Chang-Goo Kim**, W.-T. Kim, and E. C. Ostriker, September 2006, ApJL, 649:L13–L16, *Interstellar Turbulence Driving by Galactic Spiral Shocks.*

Conference Proceedings

1. **Chang-Goo Kim** and E. C. Ostriker, 2016, In P. Jablonka, P. André, and F. van der Tak, editors, *From Interstellar Clouds to Star-Forming Galaxies: Universal Processes?*, volume 315 of *IAU Symposium*, pages 38–41, *Feedback Regulated Turbulence, Magnetic Fields, and Star Formation Rates in Galactic Disks.*
2. **Chang-Goo Kim**, E. C. Ostriker, and W.-T. Kim, March 2015, Highlights of Astronomy, 16:609–610, March 2015, *Numerical modeling of multiphase, turbulent galactic disks with star formation feedback.*

Papers under Review

1. **Chang-Goo Kim**, Steve K. Choi, and Raphael Flauger, *Dust Polarization Maps from TIGRESS: E/B power asymmetry and TE correlation*, arXiv:1901.07079, ApJ submitted
2. Kareem El-Badry**, Eve C. Ostriker, **Chang-Goo Kim**, Eliot Quataert, *Evolution of supernovae-driven superbubbles with conduction and cooling*, arXiv:1902.09547, MNRAS submitted

Papers in Preparation

1. **Chang-Goo Kim**, Eve Ostriker, and the SMAUG collaboration *Numerical Simulations of Multiphase Winds and Fountains from Star-Forming Galactic Disks: II. Milky Way Analog TIGRESS Models*
2. Woorak Choi**, **Chang-Goo Kim**, and Aeree Chung, *Resolved Numerical Simulations of the Multiphase, Turbulence, Magnetized ISM Interacting with ICM Ram Pressure*
3. Kwang-Il Seon and **Chang-Goo Kim**, *Lyman-alpha Radiation Transfer: I. the Wouthuysen-Field Effect*
4. Bon-Chul Koo, **Chang-Goo Kim**, and Sangwook Park, *Radiative Supernova Remnants and Supernova Feedback*
5. Aditi Vijayan**, Lucia Armillotta, **Chang-Goo Kim**, Eve C. Ostriker, and Miao Li, *Kinematics and Dynamics of Multiphase Outflows in the solar neighborhood TIGRESS model*