Chang-Goo Kim
cgkim@astro.princeton.edu

Curriculum Vitae

Department of Astrophysical Sciences
Princeton University
4 Ivy Lane, Princeton, NJ 08544

+1-609-933-1180
http://changgoo.github.io
ORCID: 0000-0003-2896-3725

CURRENT POSITION

Sep. 2016 – **Associate Research Scholar**
Department of Astrophysical Sciences · Princeton University · Princeton · NJ · USA

Sep. 2017 – Aug. 2018 **Flatiron Research Fellow**
Center for Computational Astrophysics · Flatiron Institute · New York · NY · USA

EDUCATION

Feb. 2011 **Ph.D. in Astronomy**
Department of Physics and Astronomy · Seoul National University · Seoul · Korea
Dissertation (Advised by Prof. Woong-Tae Kim): *Thermal and Dynamical Evolution of a Gaseous Medium and Star Formation in Disk Galaxies*

Feb. 2005 **B.S. in Astronomy**
Department of Physics and Astronomy · Seoul National University · Seoul · Korea

EMPLOYMENT

Sep. 2013 – Aug. 2016 **Postdoctoral Research Associate**
Dept. of Astrophysical Sciences · Princeton University · Princeton · NJ · USA

Oct. 2011 – Aug. 2013 **CITA National Fellow**
Dept. of Physics and Astronomy · Univ. of Western Ontario · London · ON · Canada

Mar. 2011 – Aug. 2011 **BK21 Postdoctoral Fellow**
Dept. of Physics and Astronomy · Seoul National University · Seoul · Korea

AWARDS

Feb. 2011 **Department Award for Excellent Thesis**
Awarded by Dept. of Physics and Astronomy · Seoul National University

2007 – 2009 **BK21 Short-term Travel Grants for Superior Students, three times (2 mo/yr)**
Awarded by Dept. of Physics and Astronomy · Seoul National University

2007 – 2008 **Lotte Scholarship**
Full Tuition awarded by the Lotte Foundation

2005 – 2006 **Graduate Student Instructor Fellowship**
Full Tuition awarded by Seoul National University

TEACHING EXPERIENCE

Research Advisor

2018 **Erin Kado-Fong**, graduate student at Princeton University
- PhD Semeter project
- *Escape of ionizing photons and warm ionized medium in TIGRESS*
- Co-advising with Prof. Eve Ostriker and Dr. Jeong-Gyu Kim

2018 **Kareem El-Badly**, graduate student at the UC Berkeley
- Kavil Summer Program in Astrophysics
- *Effects of thermal conduction on superbubble evolution*

Co-advising with Prof. Eve Ostriker

2018 **Aditi Viyajan**, graduate student at the Indian Institute of Science
- Kavil Summer Program in Astrophysics
- *Properties of outflowing gas in TIGRESS*
- Co-advising with Dr. Lucia Armillotta, Prof. Eve Ostriker, Dr. Miao Li

2018 **Mohammad Refat**, undergraduate student at the CUNY
- AstroCom summer research intern
- *Quantifying the metal mixing in the solar neighborhood TIGRESS model*

2018 **Erin Flowers**, PhD student at Princeton University
- PhD semester project
- *Effects of spatial correlations of supernovae in ISM turbulence*
- Co-advising with Prof. Eve Ostriker

2017 – **Woorak Choi**, PhD student at Yonsei University
- PhD thesis project
- *Ram pressure stripping in the multiphase, turbulent, magnetized ISM*
- Co-advising with Prof. Aeree Chung

2014 – 2015 **Roberta Raileanu**, undergraduate student at Princeton University
- Junior Thesis, Undergraduate Summer Research Program
- *Superbubbles in the multiphase ISM and the loading of galactic winds*
- Published to ApJ. Co-advised with Prof. Eve Ostriker

2015 – 2016 **Wankee Cho**, PhD student at Seoul National University
- PhD thesis project
- *Statistical properties of the turbulent and stratified ISM*
- Now at Samsung. Co-advised with Dr. Jongsoo Kim and Prof. Bon-Chul Koo

Teaching Assistant (Graduate Student Instructor)

2005 – 2010 Department of Physics and Astronomy · Seoul National University · Seoul · Korea
- Courses: *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*
- Grading problem sets and leading problem-solving sessions

Designing and leading the Lab classes. Teaching basics of programming languages including Fortran, C, and IDL.

GRANTS/PROPOSALS

2018 **Co-I,** NASA TCAN (selected; PI: Julian Borrill)

PROFESSIONAL ACTIVITIES

2017 – **Working Group Leader,** SMAUG* collaboration
* SMAUG (Simulating Multi-scale Astrophysics to Understand Galaxies) is an international collaboration funded by the Simons Foundation, consisting of 6 institutions (CCA, Princeton, Harvard, UC Berkeley, Zurich, Heidelberg), 9 PIs, and >40 members. The collaboration aims to build a fully predictive galaxy formation theory utilizing next-generation cosmological simulations with physics-based subgrid models for small-scale baryonic physics. I'm co-leading a working group called "*Resolved ISM, Star Formation, and Stellar Feedback"*.

2017 **Review Panelist**, NSF Astronomy and Astrophysics Grant Program

2016 – 2017 **Organizer,** Star Formation/ISM Rendezvous Seminars at Princeton University

2012 – **Referee,** Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society

INVITED/CONTRIBUTED TALKS (last 3 years)

2018 **Contributed Talk,** Thinkshop15, Potsdam · Germany
2018 **Colloquium,** Yonsei University · Seoul · Korea
2018 **Colloquium,** Korea Astronomy & Space Science Institute · Daejeon · Korea
2018 **Long-term Participant & Mentor,** Kavli Summer Program in Astrophysics, CCA, NY
2018 **Invited Talk,** MPPC Workshop, Princeton University, NJ
2018 **Invited Talk,** CMB Foreground workshop, CCA, NY
2018 **Invited Talk,** Computational Galaxy Formation, Ringberg Castle · Germany
2017 **Invited Talk,** CMB Foreground workshop, UC at San Diego · CA
2017 **Seminar Talk,** Center for Computational Astrophysics, Flatiron Institute, NY
2017 **Invited Talk,** The ISM beyond 3D, Institut d'Astrophysique Spatiale · Orsay · France
2017 **Colloquium,** Theoretical Astrophysics Group, Osaka University · Osaka · Japan
2017 **Seminar Talk,** Astrophysics Seminar, UC at Santa Barbara · CA
2017 **Colloquium,** UC at Santa Barbara · CA
2016 **Colloquium,** Shanghai Jiao Tong University · Shanghai · China
2016 **Invited Talk,** 7th East-Asian Numerical Astrophysics Meeting, Beijing · China
2016 **Colloquium,** Korea Astronomy & Space Science Institute · Daejeon · Korea
2016 **Colloquium,** Seoul National University · Seoul · Korea
2016 **Poster,** KAS Fall Meeting, Daejeon · Korea
2016 **Invited Talk,** How Galaxies Form Stars, Stockholm · Sweden
2016 **Invited Talk,** Computational Galaxy Formation, Ringberg Castle · Germany
2015 **Seminar Talk,** Informal Seminar, Institute for Advanced Study · Princeton · NJ
2015 **Seminar Talk,** SFIR Seminar, Princeton University · Princeton· NJ
2015 **Contributed Talk,** Magnetic Fields in the Universe V, Corsica · France
2015 **Contributed Talk,** IAU Symposium #315, Honolulu · HI

REFERENCES

Prof. Woong-Tae Kim (thesis advisor)
wkim@astro.snu.ac.kr
Department of Physics and Astronomy
Seoul National University
+82-2-880-6769

Prof. James M. Stone
jmstone@astro.princeton.edu
Department of Astrophysical Sciences
Princeton University
+1-609-258-3815

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

Prof. Eve C. Ostriker (postdoc mentor)
eco@astro.princeton.edu
Department of Astrophysical Sciences
Princeton University
+1-609-258-7240

Prof. Snezana Stanimirovic
sstanimi@astro.wisc.edu
Department of Astronomy
University of Wisconsin-Madison
+1-608-890-1458

Prof. Greg Bryan
gbryan@astro.columbia.edu
Center for Computational Astrophysics
Flatiron Institute
Department of Astronomy
Columbia University
+1-212-854-6837

Chang-Goo Kim
ckim@flatironinstitute.org

Bibliography

REFEREED PUBLICATIONS (12 first-authored; 4 co-authored)

16. *"The 21-SPONGE HI Absorption Line Survey II: The temperature of Galactic HI"*
Murray, Claire E., Stanimirovic, Snezana, Goss, W. M. **et al.** 2018, ApJS in press

15. *"The X_{CO} Conversion Factor from Galactic Multiphase ISM Simulations"*
Gong, M., Ostriker, E. C., and **Kim, C.-G**. 2018, ApJ, 858, 16

14. *"Numerical Simulations of Multiphase Winds and Fountains from Star-forming Galactic Disks. I. Solar Neighborhood TIGRESS Model"*
Kim, C.-G. and Ostriker, E. C. 2018, ApJ, 853, 173

13. *"**T**hree-phase **I**nterstellar medium in **G**alaxies **R**esolving **E**volution with **S**tar formation and **S**upernova feedback (**TIGRESS**): Algorithms, Fiducial model, and Convergence"*
Kim, C.-G. and Ostriker, E. C. 2017, ApJ, 846, 133

12. *"Recovering Interstellar Gas Properties with HI Spectral Lines: A Comparison between Synthetic Spectra and 21-SPONGE"*
Murray, C. E., Stanimirovic, S., **Kim, C.-G.**, et al., 2017, ApJ, 837, 55

11. *"Chemistry and radiative shielding in star forming galactic disks"*
Safranek-Shrader, C., Krumholz, M. R., **Kim, C.-G.** et al. 2017, MNRAS, 465, 885

10. *"Superbubbles in the Multiphase ISM and the Loading of Galactic Winds"*
Kim, C.-G., Ostriker, E. C., & Raileanu, R. 2017, ApJ, 834, 25

9. *"Vertical Equilibrium, Energetics, and Star Formation Rates in Magnetized Galactic Disks Regulated by Momentum Feedback from Supernovae"*
Kim, C.-G. and Ostriker, E. C. 2015, ApJ, 815, 67

8. *"Momentum Injection by Supernovae in the Interstellar Medium"*
Kim, C.-G. and Ostriker, E. C. 2015, ApJ, 802, 99

7. *"Three Dimensional Hydrodynamic Simulations of Multiphase Galactic Disks with Star Formation Feedback: II. Synthetic HI 21 cm Line Observations"*
Kim, C.-G., Ostriker, E. C., & Kim, W.-T. 2014, ApJ, 786, 64

6. *"Long-Term Evolution of Decaying Magnetohydrodynamic Turbulence in the Multiphase Interstellar Medium*"
Kim, C.-G. and Basu, S. 2013, ApJ, 778, 88

5. *"Three Dimensional Hydrodynamic Simulations of Multiphase Galactic Disks with Star Formation Feedback: I. Regulation of Star Formation Rates"*
Kim, C.-G., Ostriker, E. C., & Kim, W.-T. 2013, ApJ, 776, 1

4. *"Regulation of Star Formation Rates in Multiphase Galactic Disks: Numerical Tests of the Thermal/Dynamical Equilibrium Model"*
Kim, C.-G., Kim, W.-T., & Ostriker, E. C. 2011, ApJ, 743, 25

3. *"Galactic Spiral Shocks with Thermal Instability in Vertically Stratified Galactic Disks"*
Kim, C.-G., Kim, W.-T., & Ostriker, E. C. 2010, ApJ, 720, 1454

2. *"Galactic Spiral Shocks with Thermal Instability"*
   Kim, C.-G., Kim, W.-T., & Ostriker, E. C. 2008, ApJ, 681, 1148
1. *"Interstellar Turbulence Driving by Galactic Spiral Shocks"*
   Kim, C.-G., Kim, W.-T., & Ostriker, E. C. 2006, ApJ, 649, L13

CONFERENCE PROCEEDINGS

2. *"Feedback Regulated Turbulence, Magnetic Fields, and Star Formation Rates in Galactic Disks"*
   Kim, C.-G. and Ostriker, E. C. 2016, IAU Symposium, 315, 38 (arXiv:1511.00018)
1. *"Numerical modeling of multiphase, turbulent galactic disks with star formation feedback"*
   Kim, C.-G., Ostriker, E. C., and Kim, W.-T. 2015, Highlights of Astronomy, 16, 609 (arXiv:1211.5161)

PAPERS in PREPARATION

1. *"Ly-alpha Radiative Transfer and Wouthuysen-Field effect in the Warm Neutral Medium"*
   Seon, K. and **Kim, C.-G.** in preparation
2. *"Synthetic Polarized Dust Emission Maps from MHD Simulations of the ISM: EB asymmetry"*
   Kim, C.-G. and Steve K. Choi in preparation