

JI-HOON KIM

Center for Theoretical Physics, Department of Physics and Astronomy,
Seoul National University, Seoul 08826, Republic of Korea

www.jihoonkim.org
me@jihoonkim.org

EDUCATION:

09/2005 - 06/2011 Ph. D., Department of Physics, Stanford University
03/1998 - 02/2002 B. Sc., School of Physics, *summa cum laude*, Seoul National University

PROFESSIONAL APPOINTMENTS:

03/2018 - **Assistant Professor**, Seoul National University, Republic of Korea
07/2016 - 11/2017 **Research Associate**, Stanford University / KIPAC
07/2015 - 06/2017 **Einstein Fellow**, Stanford University / SLAC National Accelerator Laboratory
07/2014 - 06/2015 Einstein Fellow, California Institute of Technology
01/2014 - 06/2014 **Moore Fellow**, California Institute of Technology
11/2013 - 12/2013 Visiting Scholar, Stanford University / KIPAC
09/2011 - 10/2013 **IMPS Postdoctoral Fellow**, University of California at Santa Cruz
09/2005 - 08/2011 Research Assistant, Stanford University

AWARDS AND FELLOWSHIPS (SELECTED):

12/2018 - 11/2023 Samsung Science & Technology Foundation Investigator
09/2018 - 08/2019 Creative-Pioneering Researchers Program Award, Seoul National University (SNU)
07/2014 - 06/2017 Einstein Postdoctoral Fellowship, NASA
01/2014 - 06/2014 Moore Postdoctoral Fellowship, California Institute of Technology
09/2005 - 03/2009 William R. and Sara Hart Kimball Graduate Fellowship, Stanford University
02/2002 Honor at Graduation by the SNU Alumni Association
03/2000 - 02/2002 Korea Foundation for Advanced Studies Fellowship
03/1998 - 02/2002 Merit-based Undergraduate Scholarships, SNU, 7 semesters
03/1998 Honor for Excellence among students entering College of Natural Science, SNU

RESEARCH EXPERIENCES:

2018 - **Assistant Professor**, Dept. of Physics and Astronomy, Seoul National University

- **AGORA Project Coordinator**, *Leading an inter-institutional collaboration for high-resolution simulations comparison since 2012 (160+ participants from 60+ institutions), having led or co-led 3+ papers, organized 7 workshops with 30+ attendees each and 15+ web conferences (as of 2018)*
- **PI, Samsung Science & Technology Foundation** "Towards the Multi-scale Understanding of the Growth of Supermassive Black Holes" (12/2018-11/2023)
- **PI, Creative-Pioneering Researchers Program at SNU** "Towards the Multi-scale Understanding of the Growth of Supermassive Black Holes" (09/2018-08/2019)
- **PI, KISTI KSC** "Towards the Multi-scale Numerical Understanding of SMBHs at Galaxy Centers" (4,600,000.0 SUs on Nurion@KSC, 15,000.0 GB on Nurion@KSC, 12/2018-11/2019)

- **PI, KISTI KSC** “Towards the Understanding of Growth & Evolution of SMBHs at Galaxy Centers” (400,000.0 SUs on Tachyon-II@KSC, 2,000.0 GB on Tachyon-II@KSC, 07/2018-10/2018)
- **Co-I, NASA HEC** “FIRE: DM and Galaxy Formation with Unprecedented Physics and Resolution” (3,166,000.0 SUs on Pleiades@NAS, 100,000.0 GB on Pleiades@NAS, 11/2016-09/2019)
- *Simulating high-redshift quasar hosts with massive black holes and star-forming molecular clouds*
- 2015 - 2017 **Research Associate / Postdoctoral Researcher**, Stanford University / SLAC (Mentor: T. Abel)
 - **PI, NSF XSEDE** “Resolving the Impact of Supermassive Black Hole & Stellar Physics on Galaxies” (3,233,887.0 SUs on Stampede@TACC, 50,000.0 GB on Ranch@TACC, 10/2015-09/2016)
 - **Co-I, NSF XSEDE** “Simulating the Local Group” (3,649,350.9 SUs on Stampede@TACC, 50,000.0 GB on Ranch@TACC, 10/2016-09/2017)
 - *Modeling the accretion and feedback of massive black hole seeds in the high-redshift universe*
- 2014 - 2015 **Postdoctoral Researcher**, California Institute of Technology (Mentor: P. Hopkins)
 - **PI, NSF XSEDE** “Resolving the Impact of Supermassive Black Holes on Galaxies” (1,200,000.0 SUs on Stampede@TACC, 20,000.0 GB on Ranch@TACC, 10/2014-09/2015)
 - *Simulating and analyzing the formation of star clusters in high-redshift proto-galaxies*
- 2013 Visiting Scholar, KIPAC / Stanford University
- 2011 - 2013 **Postdoctoral Researcher**, UC Santa Cruz (Mentors: M. Krumholz & J. Primack)
 - **Co-I, NSF XSEDE** “Star Formation in Galaxies: From Recipes to Real Physics” (on Stampede/Ranger@TACC, Pleiades@NASA, Kraken@NICS)
 - *Modeling radiative feedback of star-forming molecular clouds in galaxy formation*
- 2006 - 2011 **Research Assistant**, KIPAC / SLAC / Stanford University (Advisor: T. Abel)
 - *Simulating galaxy formation and mergers with Adaptive Mesh Refinement*
 - *Modeling the accretion and feedback of massive black holes, formation and feedback of stars*
- 2006 **Research Assistant**, KIPAC / Stanford University (Advisor: S. Church)
 - *Building data pipelines for the QUAD Collaboration*
- 2005 **Research Assistant**, KIPAC / Stanford University (Advisor: E. Bloom)
 - *Studying the cross-correlation between GRBs and SNe Ic events for the Fermi/GLAST Collaboration*
- 2001 Experiment Assistant, Nano-Opto-Electronics Laboratory, SNU (Advisor: H. -S. Jeon)

PEER-REVIEWED PUBLICATIONS:

- **13) Kim, J. -H.**, Wise, J. H., Abel, T., Hopkins, P. F., & Primack, J. R., “Galaxy Formation with Self-consistently Modeled Stars and Massive Black Holes. II: High-redshift Quasar Growth and Feedback”, *ApJ* to be submitted (2018)
- **12) Kim, J. -H.**, Ma, X., Grudic, M. Y., Hopkins, P. F., Hayward, C. C., & 5 other co-authors for the FIRE Collaboration, “Formation of Globular Cluster Candidates in Merging Proto-galaxies at High Redshift: A View from the FIRE Cosmological Simulations”, *astro-ph:1704.02988*, *MNRAS* 474 (2018) 4232
- **11)** Hopkins, P. F. et al. including **Kim, J. -H.**, “The FIRE-2 Simulations: Physics versus Numerics in Galaxy Formation”, *astro-ph:1702.06148*, *MNRAS* 480 (2018) 800
- **10)** Butsky, I., Zrake, J., **Kim, J. -H.**, Yang, H. -I., & Abel, T., “Ab Initio Simulations of A Supernova Driven Galactic Dynamo in An Isolated Galaxy”, *astro-ph:1610.08528*, *ApJ* 843 (2017) 113

- **9) Kim, J. -H.**, Agertz, O., Teyssier, R., Butler, M. J., Ceverino, D., & 38 other co-authors for the AGORA Collaboration, “The AGORA High-resolution Galaxy Simulations Comparison Project. II: Isolated Disk Test”, *astro-ph:1610.03066, ApJ* 833 (2016) 202
- **8) Wetzel, A.**, Hopkins, P. F., **Kim, J. -H.**, Faucher-Giguere, C-A., Keres, D., & Quataert, E., “Reconciling Dwarf Galaxies with LCDM Cosmology: Simulating A Realistic Population of Satellites Around A Milky Way-Mass Galaxies”, *astro-ph:1602.05957, ApJ* 827 (2016) L23
- **7) Kim, J. -H.**, Abel, T., Agertz, O., Bryan, G. L., Ceverino, D., & 41 other co-authors for the AGORA Collaboration, “The AGORA High-resolution Galaxy Simulations Comparison Project”, *astro-ph:1308.2669, ApJS* 210 (2014) 14
- **6) The Enzo Collaboration including Kim, J. -H.**, “Enzo: An Adaptive Mesh Refinement Code for Astrophysics”, *astro-ph:1307.2265, ApJS* 211 (2014) 19
- **5) Kim, J. -H.**, Krumholz, M. R., Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T., “Dwarf Galaxies with Ionizing Radiation Feedback. II: Spatially-resolved Star Formation Relation”, *astro-ph:1210.6988, ApJ* 779 (2013) 8
- **4) Kim, J. -H.**, Krumholz, M. R., Wise, J. H., Turk, M. J., Goldbaum, N. J., & Abel, T., “Dwarf Galaxies with Ionizing Radiation Feedback. I: Escape of Ionizing Photons”, *astro-ph:1210.3361, ApJ* 775 (2013) 109
- **3) Kim, J. -H.**, & Lee, J., “How Does the Surface Density and Size of Disk Galaxies Measured in Hydrodynamic Simulations Correlate with the Halo Spin Parameter?”, *astro-ph:1210.8321, MNRAS* 432 (2013) 1701
- **2) Kim, J. -H.**, Wise, J. H., Alvarez, M. A., & Abel, T., “Galaxy Formation with Self-consistently Modeled Stars and Massive Black Holes. I: Feedback-regulated Star Formation and Black Hole Growth”, *astro-ph:1106.4007, ApJ* 738 (2011) 54
- **1) Kim, J. -H.**, Wise, J. H., & Abel, T., “Galaxy Mergers with Adaptive Mesh Refinement: Star Formation and Hot Gas Outflow”, *astro-ph:0902.3001, ApJ* 694 (2009) L123

OTHER CONTRIBUTIONS:

- **5) Pineda, J. L. et al. including Kim, J. -H.**, “Bridging the Gap: Observations and Theory of Star Formation Meet on Large and Small Scales”, *Keck Institute for Space Studies Report, Pasadena, CA, November 2014*
- **4) Kaehler, R.**, Abel, T., & **Kim, J. -H.**, “Visualization of a High-resolution Galaxy Formation Simulation”, *SuperComputing '11 Scientific Visualization Companion Proceedings, pp. 133-134, Seattle, WA, November 2011*
- **3) Kim, J. -H.**, “Galaxy Formation and Mergers with Stars and Massive Black Holes”, *Doctoral Dissertation, Stanford University, Stanford, CA, May 2011*
- **2) Kim, J. -H.**, Wise, J. H., & Abel, T., “Galaxy Mergers with Adaptive Mesh Refinement: Star Formation and Hot Gas Outflow”, *American Physical Society April Meeting, Denver, CO, May 2009*
- **1) Kim, J. -H.**, Wise, J. H., & Abel, T., “Galaxy Evolution on Adaptive Mesh Refinement”, *First Stars III Conference, AIP Conference Proceedings, Vol. 990 (2008) pp. 429-431, Santa Fe, NM, July 2007*

PROFESSIONAL AND OUTREACH SERVICES:

2018	Organizer , 7th Workshop for the AGORA Project at UC Santa Cruz (Aug. 10-11, 2018)
2018 -	Committees Served : Graduate Admissions, Graduate Qualification, Academic Affairs
2017	Organizer, 6th Workshop for the AGORA Project at UC Santa Cruz (Aug. 11-13, 2017)
2016	Expert Referee, DiRAC Resource Allocation Committee, the United Kingdom
2016	External Review Panel, NASA Postdoctoral Program Fellowship
2016	Organizer, 5th Workshop for the AGORA Project at UC Santa Cruz (Aug. 12-14, 2016)

- 2015 Organizer, 4th Workshop for the AGORA Project at UC Santa Cruz (Aug. 21-23, 2015)
- 2015 External Review Panel, Department of Energy ASCR Leadership Computing Challenge
- 2015 External Review Panel, NASA Earth and Space Science Fellowship
- 2014 Organizer, 3rd Workshop for the AGORA Project at UC Santa Cruz (Aug. 15-17, 2014)
- 2014 - **Referees Served:** Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astronomy and Computing
- 2013 Organizer, 2nd Workshop for the AGORA Project at UC Santa Cruz (Aug. 16-18, 2013)
- 2012 External Review Panel, NASA Earth and Space Science Fellowship
- 2012 Organizer, Starting Workshop for the AGORA Project at UC Santa Cruz (Aug. 17-19, 2012)
- 2012 - **Project Coordinator,** AGORA High-resolution Galaxy Simulations Comparison Project
- 2010 Provided a movie data of cosmological galaxy mergers and structure formation for the SLAC booth in the SuperComputing '10 conference (SC2010), New Orleans, LA
- 2010 Provided a movie data of cosmological galaxy mergers for the Hayden Planetarium at the American Museum of Natural History, NY in the program of "The Big Bang"
- 2007 - 2011 KIPAC/SLAC Visualization Laboratory Presenter, Laboratory Tour Guide
- 2007 - 2009 Volunteer, SLAC Kids' Day
- 2002 - 2004 Lieutenant, Company Commander & Battalion Staff Officer, the Republic of Korea Army

TEACHING EXPERIENCES:

- 2019 **Lecturer,** 2 semesters, Seoul National University, *Classical Mechanics I & II*
- 2018 **Lecturer,** Korea Institute for Advanced Studies - Seoul National University
Physics Winter Camp 2018, *Astrophysical Dark Matter*
- 2018 **Lecturer,** 1 semester, Seoul National University, *Topics in Modern Astrophysics and Cosmology*
- 2018 Guest Lecturer, Seoul National University, *Classical Mechanics*
- 2016 Guest Lecturer, Stanford University, *Computational Cosmology and Astrophysics*
- 2014 Guest Lecturer, California Institute of Technology, *Cosmology and Galaxy Formation*
- 2009 Teaching Assistant, 1 quarter, Stanford University, *Black Holes*
- 2008 Course Grader, 1 quarter, Stanford University, *Introduction to Astrophysics*
- 2007 Teaching Assistant, 1 quarter, Stanford University, *Modern Physics Laboratory*
- 2007 Teaching Assistant, 1 quarter, Stanford University, *Mechanics*

ACADEMIC ADVISING EXPERIENCES:

- 09/2018 - Ki-won Kim (M.S. student in Physics)
- 03/2018 - Yongseok Jo (Ph.D. student in Physics), Eun-jin Shin (M.S. student in Physics)

COMPUTING EXPERIENCES:

- Administrator of a 72-processor (144-thread) Intel Xeon SP Gold cluster with 1 TB shared memory (2018 -)
- Program experience: Enzo, Gadget, GIZMO, yt, MUSIC, VisIt, PartiView, HEALpix, CMBFast, etc.
- Language experience: C, C++, Fortran, IDL, Python, Java Applet, Visual Basic, Pascal, Matlab, HTML, etc.

RESEARCH INTERESTS:

- Coordinator, AGORA High-resolution Galaxy Simulations Comparison Project (AGORAsimulations.org)
- Galaxy Formation and Evolution using High-resolution Adaptive Mesh Refinement Simulations
- Radiative/Mechanical/Thermal Feedback from Massive Black Holes and Star-forming Molecular Clouds
- Growth of Supermassive Black Holes and Triggered Star Formation via Gas Inflow or Mergers

TALKS AND SEMINARS (SELECTED):

- **4th Korean-American Kavli Frontiers of Science Symposium**, sponsored by the U.S. National Academy of Sciences (NAS) and the Korean Academy of Science and Technology (KAST), TBA, 06/2019
- **Extremely Big Eyes on the Early Universe**, *Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo*, TBA, 03/2019
- **Physics Colloquium**, *Seoul National University*, "Towards the Understanding of the Growth and Evolution of Supermassive Black Holes at Galaxy Centers", 12/05/2018
- **Physics and Astronomy Colloquium**, *Sejong University*, "Towards the Understanding of the Growth and Evolution of Supermassive Black Holes at Galaxy Centers", 11/21/2018
- **8th KIAS Workshop on Cosmology and Structure Formation**, *Korea Institute for Advanced Study*, "Towards the Understanding of the Growth and Evolution of Supermassive Black Holes at Galaxy Centers", 11/06/2018
- **99th Korean Astronomical Society Meeting**, hosted by KAS, "Towards the Understanding of the Growth and Evolution of Supermassive Black Holes at Galaxy Centers", 10/10/2018
- **Physics Seminar**, *Korea Institute for Advanced Study*, "Dark Matter: A Computational Astrophysicist's Perspective", 10/08/2018
- **Particle Physics Korea Meeting**, *Seoul National University*, "Dark Matter: A Computational Astrophysicist's Perspective", 09/28/2018
- **Santa Cruz Galaxy Formation Workshop+7th AGORA Workshop**, *UC Santa Cruz*, joint with Joel Primack, "Overview of the AGORA High-resolution Cosmological Galaxy Simulations Comparison Project: Six Years After Conception", 08/10/2018
- **KDESci Meeting**, *Korea Institute for Advanced Study*, "Insights from the AGORA High-resolution Galaxy Simulations Comparison", 07/09/2018
- **Galaxies A to Z Workshop**, hosted by *Center for Galaxy Evolution Research at Yonsei University*, "Studying the Interaction of Supermassive Black Holes and Their Host Galaxies", 06/26/2018
- **Astronomy Colloquium**, *Seoul National University*, "Upcoming Era in Numerical Galaxy Formation: New Possibilities and Challenges", 05/24/2018
- **Santa Cruz Galaxy Formation Workshop+6th AGORA Workshop**, *UC Santa Cruz*, "Reproducibility: An Insight from the AGORA High-resolution Galaxy Simulations Comparison", 08/11/2017
- **Einstein Fellows Symposium 2016**, *Harvard-Smithsonian Center for Astrophysics*, "Reproducibility: An Insight from the AGORA High-resolution Galaxy Simulations Comparison", 10/18/2016
- **Santa Cruz Galaxy Formation Workshop+5th AGORA Workshop**, *UC Santa Cruz*, "The AGORA High-resolution Galaxy Simulations Comparison. II: Isolated Disk Test - Kickoff Discussion", 08/12/2016
- **Einstein Fellows Symposium 2015**, *Harvard-Smithsonian Center for Astrophysics*, "Upcoming New Era in Numerical Galaxy Formation: New Challenges and Possibilities", 10/27/2015
- **Santa Cruz Galaxy Formation Workshop+4th AGORA Workshop**, *UC Santa Cruz*, "AGORA Initiative and Infrastructure: Where We Stand and Why We Are Here", 08/21/2015

- **KIPAC Tea Talk**, *SLAC National Accelerator Laboratory*, “Challenges in Numerical Galaxy Formation and the AGORA Initiative”, 07/24/2015
- **Pasadena Astronomy Postdoc Symposium 2015**, *UCLA Lake Arrowhead Conference Center*, “Challenges in Numerical Galaxy Formation and the AGORA Initiative”, 04/09/2015
- **Astronomy Theory Postdoc Lunch**, *Caltech*, “AGORA High-resolution Galaxy Simulations Comparison Project”, 01/22/2015
- **Astronomy Colloquium**, *Seoul National University*, “Galaxy Formation Simulations in the High-resolution Era: Success and Challenge”, 12/10/2014
- **Einstein Fellows Symposium 2014**, *Harvard-Smithsonian Center for Astrophysics*, “Challenges in Numerical Galaxy Formation and the AGORA Initiative”, 10/28/2014
- **Santa Cruz Galaxy Formation Workshop+3rd AGORA Workshop**, *UC Santa Cruz*, joint with Joel Primack, “Status of the AGORA High-resolution Cosmological Galaxy Simulations Comparison Project: Two Years After Conception”, 08/15/2014
- **Carnegie Observatories Colloquium Series**, *Carnegie Observatories*, “Rethinking Galaxy Simulations in the High-resolution Era”, 03/18/2014
- **Santa Cruz Galaxy Formation Workshop+2nd AGORA Workshop**, *UC Santa Cruz*, “The AGORA Project: Initial Conditions and the Proof-of-concept Test”, 08/16/2013
- **Cosmology Seminar**, *Stanford University*, “Rethinking Galaxy Simulations in the High-resolution Era”, 05/20/2013
- **Santa Cruz Galaxy Formation Workshop+Starting Workshop for the AGORA High-resolution Galaxy Simulations Comparison Project**, *UC Santa Cruz*, “Galaxy Formation with Radiating Molecular Cloud Particles”, 08/17/2012
- **Workshop for Korean Young Cosmologists**, *Korea Astronomy and Space Science Institute*, “High-resolution Galaxy Formation with Massive BHs and Radiating Star Clusters”, 06/25/2012
- **SLAC Association for Student Seminars**, *SLAC National Accelerator Laboratory*, 05/11/2011
- **KIPAC Tea Talk**, *SLAC National Accelerator Laboratory*, “Galaxy Formation and Mergers with Self-consistently Modeled Stars and Massive BHs”, 04/08/2011
- **Friday Lunchtime Astrophysics Seminar**, *UC Santa Cruz*, “Towards An Unabridged Understanding of The Coevolution of Galaxies and Massive BHs: What Have Simulators Tried? Why So Hard?”, 12/10/2010
- **Computational Astrophysics Group Seminar**, *U. Chicago*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 12/03/2010
- **Computational Cosmology and Galaxy Formation Seminar**, *Princeton University*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 11/15/2010
- **Theoretical Astrophysics Center Seminar**, *UC Berkeley*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 10/25/2010
- **Cosmoclub Seminar**, *UC Santa Cruz*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 10/18/2010
- **Friday Astro Lunch**, *UC Santa Barbara*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 10/15/2010
- **Astronomy Tea Talk**, *Caltech*, “Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution”, 10/11/2010

- **LCA Group Seminar**, *UC San Diego*, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs", 09/30/2010
- **Santa Cruz Galaxy Formation Workshop**, *UC Santa Cruz*, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs", 08/17/2010
- **HIPACC Summer School on Galaxy Formation**, *UC-HIPACC*, "Galaxy Formation using Enzo with Properly Modeled Stars and Massive BHs", 07/28/2010
- **Santa Cruz Galaxy Formation Workshop**, *UC Santa Cruz*, "Galaxy Mergers and Evolution with Adaptive Mesh Refinement", 08/19/2009
- **Cosmology In Northern California Meeting** (CINC09), *UC Santa Cruz*, "Galaxy Mergers and Evolution with Adaptive Mesh Refinement", 05/15/2009
- **American Physical Society April Meeting**, *Session G8 - Plasma Astrophysics of Clusters of Galaxies, Denver*, "Galaxy Mergers with Adaptive Mesh Refinement: Star Formation and Hot Gas Outflow", 05/03/2009
- **JILA Astrophysics Lunch**, *CU Boulder*, "Galaxy Mergers with Adaptive Mesh Refinement", 05/01/2009
- **Bay Area Star Formation Workshop**, *Stanford University*, "Galaxy Mergers with Adaptive Mesh Refinement", 11/14/2008
- **KIPAC Tea Talk**, *SLAC National Accelerator Laboratory*, "Galaxy Mergers with Adaptive Mesh Refinement", 11/07/2008
- **KIPAC Tea Talk**, *Stanford University*, "Simulating Galaxies on Adaptive Mesh Refinement", 04/24/2007