

JI-HOON KIM

KIPAC, Stanford University & SLAC National Accelerator Laboratory
2575 Sand Hill Road, MS 29, Menlo Park, CA 94025, USA, 1(650)714-2879

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:

07/2016 - **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

FELLOWSHIPS AND PRIZES (SELECTED):

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 Seoul National University (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:

2015 - **Research Associate / Postdoctoral Researcher**, Stanford University/SLAC (Mentor: T. Abel)
• **PI, NSF XSEDE "Resolving the Impact of Supermassive Black Hole and Stellar Physics on Galaxies"**
(3,233,887.0 SUs on Stampede@TACC, 50,000.0 GB on Ranch@TACC, 10/2015-09/2016)
• **Co-PI, 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)
• **AGORA Project Coordinator**, *Leading an inter-institutional collaboration for high-resolution simulations comparison since 2012* (150+ participants from 60+ institutions), *having led or co-led 3+ papers, organized 6 workshops with 40+ attendees each and 15+ web conferences, as of Aug. 2017*
• *Simulating high-redshift quasar hosts with massive black holes and star-forming molecular clouds*
• *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)
• *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-PI, 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., Hopkins, P. F., & Abel, T., “Galaxy Formation with Self-consistently Modeled Stars and Massive Black Holes. II: High-redshift Quasar Growth and Feedback”, *ApJ to be submitted* (2017)
- **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 submitted* (2017)
- **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 submitted* (2017)
- **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

TEACHING EXPERIENCES:

- 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 Lab*
- 2007 **Teaching Assistant**, 1 quarter, Stanford University, *Mechanics*
- 1998 - 2005 Private Tutor, paid or volunteer, 15+ students at levels ranging from elementary to high school

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

COMPUTATIONAL SKILLS:

- 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.

TALKS AND SEMINARS (SELECTED):

- **Santa Cruz Galaxy Formation Workshop+6th AGORA Workshop**, UC Santa Cruz, "Reproducibility: An Insight from the AGORA High-resolution Galaxy Simulations Comparison", 08/11/17
- **Einstein Fellows Symposium 2016**, Harvard-Smithsonian Center for Astrophysics, "Reproducibility: An Insight from the AGORA High-resolution Galaxy Simulations Comparison", 10/18/16
- **Santa Cruz Galaxy Formation Workshop+5th AGORA Workshop**, UC Santa Cruz, "The AGORA High-resolution Galaxy Simulations Comparison. II: Isolated Disk Test - Kickoff Discussion", 08/12/16
- **Einstein Fellows Symposium 2015**, Harvard-Smithsonian Center for Astrophysics, "Upcoming New Era in Numerical Galaxy Formation: New Challenges and Possibilities", 10/27/15
- **Santa Cruz Galaxy Formation Workshop+4th AGORA Workshop**, UC Santa Cruz, "AGORA Initiative and Infrastructure: Where We Stand and Why We Are Here", 08/21/15
- **KIPAC Tea Talk**, SLAC National Accelerator Laboratory, "Challenges in Numerical Galaxy Formation and the AGORA Initiative", 07/24/15
- **Pasadena Astronomy Postdoc Symposium 2015**, UCLA Lake Arrowhead Conference Center, "Challenges in Numerical Galaxy Formation and the AGORA Initiative", 04/09/15
- **Astronomy Theory Postdoc Lunch**, Caltech, "AGORA High-resolution Galaxy Simulations Comparison Project", 01/22/15
- **Astronomy Colloquium**, Seoul National University, invited, "Galaxy Formation Simulations in the High-resolution Era: Success and Challenge", 12/10/14
- **Einstein Fellows Symposium 2014**, Harvard-Smithsonian Center for Astrophysics, "Challenges in Numerical Galaxy Formation and the AGORA Initiative", 10/28/14

- **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", 08/15/14*
- **Carnegie Observatories Colloquium Series**, *Carnegie Observatories, invited, "Rethinking Galaxy Simulations in the High-resolution Era", 03/18/14*
- **Santa Cruz Galaxy Formation Workshop+2nd AGORA Workshop**, *UC Santa Cruz, "The AGORA Project: Initial Conditions and the Proof-of-concept Test", 08/16/13*
- **Cosmology Seminar**, *Stanford University, invited, "Rethinking Galaxy Simulations in the High-resolution Era", 05/20/13*
- **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", 08/17/12*
- **Workshop for Korean Young Cosmologists**, *Korea Astronomy and Space Science Institute, invited, "High-resolution Galaxy Formation with Massive BHs and Radiating Star Clusters", 06/25/12*
- **SLAC Association for Student Seminars**, *SLAC National Accelerator Laboratory, 05/11/11*
- **KIPAC Tea Talk**, *SLAC National Accelerator Laboratory, "Galaxy Formation and Mergers with Self-consistently Modeled Stars and Massive BHs", 04/08/11*
- **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?", 12/10/10*
- **Computational Astrophysics Group Seminar**, *U. Chicago, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution", 12/03/10*
- **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", 11/15/10*
- **Theoretical Astrophysics Center Seminar**, *UC Berkeley, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution", 10/25/10*
- **Cosmoclub Seminar**, *UC Santa Cruz, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution", 10/18/10*
- **Friday Astro Lunch**, *UC Santa Barbara, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution", 10/15/10*
- **Astronomy Tea Talk**, *Caltech, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs: Towards An Unabridged Understanding of Their Coevolution", 10/11/10*
- **LCA Group Seminar**, *UC San Diego, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs", 09/30/10*
- **Santa Cruz Galaxy Formation Workshop**, *UC Santa Cruz, "Galaxy Formation with Self-consistently Modeled Stars and Massive BHs", 08/17/10*
- **HIPACC Summer School on Galaxy Formation**, *UC-HIPACC, "Galaxy Formation using Enzo with Properly Modeled Stars and Massive BHs", 07/28/10*
- **Santa Cruz Galaxy Formation Workshop**, *UC Santa Cruz, "Galaxy Mergers and Evolution with Adaptive Mesh Refinement", 08/19/09*
- **Cosmology In Northern California Meeting (CINC09)**, *UC Santa Cruz, "Galaxy Mergers and Evolution with Adaptive Mesh Refinement", 05/15/09*

- **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”, 05/03/09
- **JILA Astrophysics Lunch**, *CU Boulder*, “Galaxy Mergers with Adaptive Mesh Refinement”, 05/01/09
- **Bay Area Star Formation Workshop**, *Stanford University*, “Galaxy Mergers with Adaptive Mesh Refinement”, 11/14/08
- **KIPAC Tea Talk**, *SLAC National Accelerator Laboratory*, “Galaxy Mergers with Adaptive Mesh Refinement”, 11/07/08
- **KIPAC Tea Talk**, *Stanford University*, “Simulating Galaxies on Adaptive Mesh Refinement”, 04/24/07