

# SAN HAN

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 <https://github.com/sanhancluster> ◊  <https://bitbucket.org/sanhancluster>

## EDUCATION

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Yonsei University

– Ph.D. (Joint Program), Astronomy

2017–2024

– B.S., Astronomy

2013–2017

Korea Science Academy (high school)

2010–2013

## CAREER

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Institut d'Astrophysique de Paris (IAP)

2024–

## RESEARCH EXPERIENCE

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**Implementation of Cosmic ray physics in Dyablo**

2024–

– Post-doctoral project in IAP. Implementing the cosmic ray physics in the new hydrodynamic simulation code Dyablo.

**Large Zoom-in Simulation of a Galaxy Cluster**

2019–now

– Supervised by Prof. Suhyoung K. Yi. Playing a primary role in the design and execution of the NewCluster project, a high-resolution cosmological zoom-in simulation of a galaxy cluster.

**Code Development for Simulations**

2019–2024

– Developed RAMSES-yOMP, a modified version of the hydrodynamic simulation code RAMSES that features performance enhancement and chemical/dust evolution.  
– Developed an efficient reading and imaging package for RAMSES output based on NumPy.

**Velocity Dispersion Profiles of Galaxies**

2021–2024

– Supervised by Prof. Suhyoung K. Yi. Compared simulations and IFU observations to reconcile the origin of the various velocity dispersion profiles of galaxies.

**Preprocessing of dark halos in clusters**

2017–2018

– Supervised by Dr. Rory Smith and Prof. Suhyoung K. Yi. Used a cosmological simulation of galaxy clusters to quantify the impact of preprocessing on the population of dark halos in galaxy clusters.

## SKILLS

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**Languages**

Korean (Native), English

**Programming & Data analysis**

Python, Fortran, Java, Linux

**High Performance Computing**

RAMSES, MPI, OpenMP

## PUBLICATIONS

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**ADS Publication List** <https://ui.adsabs.harvard.edu/search/q=orcid%3A0000-0001-9939-713X>  
**ORCID** 0000-0001-9939-713X

*RAMSES-yOMP: Performance Optimizations for the Astrophysical Hydrodynamic Simulation Code RAMSES* **2025**

**S. Han**, S. K. Yi, S. Oh, M. Pak, S. M. Croom, J. Devriendt, Y. Dubois, T. Kimm, K. Kraljic, C. Pichon, M. Volonteri; **ApJ**, 978, 96

*A super-Eddington-accreting black hole 1.5 Gyr after the Big Bang observed with JWST* **2025**  
H. Suh, J. Scharwächter, E. Farina, F. Loiacono, G. Lanzuisi, G. Hasinger, S. Marchesi, M. Mezcuca, R.; Decarli, B. Lemaux, M. Volonteri, F. Civano, S. Yi, **S. Han**, M. Rawlings, D Hung, **NatAs**, 9, 271

*On the Origin of Star Formation Quenching of Galaxies in Group Environments Using the NewHorizon Simulation* **2024**

J. Rhee, S. Yi, J. Ko, E. Contini, J. Jang, S. Jeon, **S. Han**, C. Pichon, Y. Dubois, K. Kraljic, S. Peirani, **ApJ**, 971, 111

*Galaxies with grains: unraveling dust evolution and extinction curves with hydrodynamical simulations* **2024**

Y. Dubois, F. R. Montero, C. Guerra, M. Trebitsch, **S. Han**, R. Beckmann, S. K. Yi, J. Lewis, J. Jang; **A&A**, 687, A240

*On the Origin of the Variety of Velocity Dispersion Profiles of Galaxies* **2024**

**S. Han**, S. K. Yi, S. Oh, M. Pak, S. M. Croom, J. Devriendt, Y. Dubois, T. Kimm, K. Kraljic, C. Pichon, M. Volonteri; **ApJ**, 968, 96

*Cosmic evolution of black hole-spin and galaxy orientations: clues from the NewHorizon and Galactica simulations* **2024**

S. Peirani, Y. Suto, R. S. Beckmann, M. Volonteri, Y. Lin, Y. Dubois, S. K. Yi, C. Pichon, K. Kraljic, M. Park, J. Devriendt, **S. Han**, W. Chen; **A&A**, 686, A233

*Diffuse Light in Milky-Way like Haloes* **2024**

E. Contini, **S. Han**, S. Jeon, J. Rhee, S. K. Yi; **ApJL**, 962, 7

*On the Significance of the Thick Disks of Disk Galaxies* **2024**

S. K. Yi, J. K. Jang, J. Devriendt, Y. Dubois, **S. Han**, T. Kimm, K. Kraljic, M. Park, S. Peirani, C. Pichon, J. Rhee; **ApJS**, 271, 25

*The Connection between the Intracluster Light and its Host Halo: Formation Time and Contribution from Different Channels* **2024**

E. Contini, S. Jeon, J. Rhee, **S. Han**, S. K. Yi; **ApJ**, 167, 12

*The Intracluster Light and its Link with the Dynamical State of the Host Group/Cluster: the Role of the Halo Concentration* **2023**

E. Contini, S. Jeon, J. Rhee, **S. Han**, S. K. Yi; **ApJ**, 958, 12

*Star Formation History and Transition Epoch of Cluster Galaxies Based on the Horizon-AGN Simulation* **2022**

S. Jeon, S. K. Yi, Y. Dubois, A. Chung, J. Devriendt, **S. Han**, R. A. Jackson, T. Kimm, C. Pichon, J. Rhee; **ApJ**, 941, 13

*YZiCS: On the Mass Segregation of Galaxies in Clusters* **2020**

S. Kim, E. Contini, H. Choi, **S. Han**, J. Lee, S. Oh, X. Kang, S. K. Yi; **ApJ**, 905, 8

- YZiCS: Unveiling the Quenching History of Cluster Galaxies Using Phase-space Analysis*      **2020**  
 J. Rhee, R. Smith, H. Choi, E. Contini, S. L. Jung, **S. Han**, S. K. Yi; **ApJ**, 247, 18
- YZiCS: Preprocessing of Dark Halos in the Hydrodynamic Zoom-in Simulation of Clusters*      **2018**  
**S. Han**, R. Smith, H. Choi, L. Cortese, B. Catinella, E. Contini, S. K. Yi; **ApJ**, 866, 78

## SELECTED CONFERENCE TALKS / POSTERS

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IAP colloquium: New simulations for new problems in galaxy formation (Talk)	<b>Dec 2023</b>
Korea Astronomy Society Fall Meeting (Talk)	<b>Oct 2023</b>
Ramses User Meeting (Talk)	<b>Apr 2023</b>
Korea Astronomy Society Spring Meeting (Talk)	<b>Apr 2023</b>
European Astronomical Society Annual Meeting (Poster)	<b>Jun 2022</b>
Ramses User Meeting (Talk)	<b>Sep 2021</b>
Ramses User Meeting (Talk)	<b>Oct 2021</b>
American Astronomical Society 233 <sup>rd</sup> Meeting (Talk)	<b>Jan 2019</b>
Ramses User Meeting (Talk)	<b>Sep 2018</b>
Korea Astronomy Society Fall Meeting (Talk)	<b>May 2018</b>
Korea Astronomy Society Spring Meeting (Poster)	<b>May 2018</b>

## SELECTED SUPERCOMPUTER TIME

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<b>KISTI HPC R&amp;D Innovation Support Program (Grand Challenge)</b> KSC-2019-CHA-0006	<b>2019</b>
<b>KISTI HPC R&amp;D Innovation Support Program (Creative Research)</b> KSC-2023-CRE-0343, KSC-2022-CRE-0409, KSC-2022-CRE-0344, KSC-2022-CRE-0088, KSC-2021-CRE-0486, KSC-2020-CRE-0280, KSC-2020-CRE-0055, KSC-2018-CRE-0114	<b>2018–2023</b>

## TEACHING EXPERIENCE

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<b>Teaching Assistant</b> , Yonsei University	
– Earth & Universe	<b>Fall 2018</b>
– Galaxy & Universe 2	<b>Spring 2018</b>
– Astrophysics 2	<b>Fall 2017</b>
– Understanding of Space	<b>Spring 2017</b>
<b>Teaching Assistant</b> , Korea Astronomy Olympiad Winter School	<b>Jan 2016–Jan 2017</b>

## AWARDS AND SCHOLARSHIPS

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<b>Brain Korea 21 Plus</b> , National Research Foundation of Korea	<b>2017–2023</b>
<b>The 6<sup>th</sup> Asian-Pacific Astronomy Olympiad</b> , won the 1-st prize	<b>Dec 2010</b>

## OTHER ACTIVITIES

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<b>WouldYouLike</b> , A student-run astronomy magazine dedicated to public outreach. Contributed as a writer.	<b>2014–2016</b>
<b>Byeol-arum</b> , Astronomical observation and outreach club. Participated as a science educator for the public.	<b>2013–2016</b>