

Hyowon Kim

Post-doctoral Researcher in extragalactic science

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Personal information

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- ORCID : 000-0003-4032-8572
- GitHub repository : <https://github.com/kimyo1>
- ADS library for publication

Research Interests

- Formation and evolution of Galaxy systems
- Environmental effect on galaxy and galaxy systems
- Effect from Large-scale structures on galaxy cluster
- Connection between High- z proto-clusters and proto-BCGs (or protocluster core) to current clusters and BCGs
- Observational cosmology

Education

- March, 2017– Feb, 2024 **University of Science and Technology, Korea,**
Department of Astronomy and Space science, Integrated course of Ph.D..
- May, 2010– Feb, 2015 **Kyungpook National University, Korea,**
Department of Astronomy and Atmospheric science, Bachelor of Astronomy.

Paper: First-author

"New observational recipes for measuring dynamical state of galaxy clusters".

- Hyowon Kim; Rory Smith; Jongwan Ko; Jongho Shinn; Kyungwon Chun; Jihye Shin; Jaewon Yoo
- 2024, ApJ, 970, 165, Published

"Is the Abell 2261 a fossil galaxy cluster in a transitional dynamical state?"

- Hyowon Kim; Jongwan Ko; Rory Smith; Jae-Woo Kim; Ho-Seong Hwang; Hyunmi Song; Jihye Shin; Jaewon Yoo
- 2022, ApJ, 928, 170, published

Paper: Co-author

"Spatial Distribution of Intracluster Light versus Dark Matter in Horizon Run 5".

- Jaewon Yoo; Changbom Park; Cristiano G. Sabiu; Ankit Singh; Jongwan Ko; Jaehyun Lee; Christophe Pichon; M. James Jee; Brad K. Gibson; Owain Snaith; Juhan Kim; Jihye Shin; Yonghui Kim; **Hyowon Kim**
- 2024, ApJ, 965, 145, Published

"BCG alignment with the locations of cluster members and the large-scale structure out to $10R_{200}$ ".

- Smith Rory; Ho Seong Hwang; Katarina Kraljic; Paula Calderon-Castillo; Thomas M. Jackson; Anna Pasquali; Jihye Shin; Jongwan Ko; Jaewon Yoo; **Hyowon Kim** ; Jae-woo Kim
- 2023, MNRAS, 525, 4685S, Published

"How to quantify the similarity of 2D distributions: Comparison of spatial distribution of Intracluster light and Dark Matter".

- o Jaewon Yoo; Jongwan Ko; Jihye Shin; Cristiano G. Sabiu; Kyungwon Chun; Ho Seong Hwang; Juhan Kim; M. James Jee; **Hyowon Kim**; Rory Smith
- o 2022, ApJS, 261, 28, Published

"Intracluster light properties in a fossil cluster at $z = 0.47$ ".

- o Jaewon Yoo; Jongwan Ko; Jae-Woo Kim; **Hyowon Kim**
- o 2021, MNRAS, 508, 2634Y, Published

Observing Experience

2024A **Reading the formation history of fossil BCGs: are they made with M^* galaxies?**

- o P.I. Hyowon Kim
- o Gemini-North long slit spectroscopy observation
- o Proposal author

2023A **The origin of a fossil cluster by testing the M^* galaxy merger hypothesis.**

- o P.I. Hyowon Kim
- o Gemini-North IFU spectroscopy observation
- o Proposal author

2019A&B **Probing the galaxy populations of merging galaxy clusters from filaments to the core.**

- o P.I. Kyle finner
- o MMT Hectospec Spectroscopy observation
- o Proposal co-author

2018A **Constraining the ICL formation mechanism using fossil clusters at redshift 0.45.**

- o P.I. Jaewon Yoo
- o Gemini-North Optical observation
- o Proposal co-author

2017B **Tracing the origin of the intracluster light in massive galaxy clusters at $z > 1$: a case of MOO J1014+0084.**

- o P.I. Jongwan Ko
- o Gemini-South slit spectroscopy observation
- o Phase II design

2017A **Addressing The Evolutionary History of Galaxy Clusters through Member Galaxies.**

- o P.I. Jae-Woo Kim
- o MMT Hectospec Spectroscopy observation
- o Data reduction

Funds

2023 **ALMA ANID fund, Fund.**

- o "New techniques for accurate catalogs of cluster dynamical states to study cluster evolution"
- o 2024.~ 2026.

2023 **UST Young Scientist fund, Fund.**

- o "Study of the dynamical state of the galaxy cluster as a proxy of matter evolution of the universe"
- o 2022.12.01.~2023.11.30.

2022 **UST overseas program, Fund.**

- o "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
- o 1st, Apr ~ 26th, Jun, 2022
- o Universidad Technica Frederico de Santa Maria, Santiago, Chile

Institutional Responsibilities & mentoring

2025 **Co-supervising of student.**

- o Patricio Olivares (USM, Master)

2024 **Examinator of midterm defense.**

- o Tomas Fuetes (USM, Ph.D)

Conference and Talk

- Aug 2024 **19th SPLUS collaboration meeting, Brazil.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- Jun 2023 **Meeting of the American Astronomical Society, U.S.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Poster
- May 2023 **Galaxy Groups and Clusters III, Chile.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- Feb 2023 **Galaxy evolution workshop, Japan.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Poster+flash talk
- Sep 2022 **Korea Astronomical society meeting, Korea.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- Agu 2022 **IAU General Assembly meeting, Korea.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ poster
- Oct 2022 **Korea astronomical society meeting, Korea.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- May 2022 **IV Workshop on Numerical and Theoretical Astrophysics, Chile.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- Feb 2022 **2021 Galaxy evolution workshop, Zoom.**
○ "Developing new recipes for measuring the dynamical state of galaxy clusters using simulations"
○ Oral talk
- spring 2019 **Korea astronomical society meeting, Korea.**
○ "Abell 2261: a fossil galaxy cluster in a transition phase?"
○ Oral talk
- Jan 2019 **Galaxy formation workshop 2019, Korea.**
○ "Abell 2261: a fossil galaxy cluster in a transition phase?"
○ Oral talk
- Jan 2019 **Infrared Medium-Deep Survey Workshop 2019, Korea.**
○ "Abell 2261: a fossil galaxy cluster in a transition phase?"
○ Oral talk
- fall 2018 **Korea astronomical society meeting, Korea.**
○ "Abell 2261: a fossil galaxy cluster in a transition phase?"
○ Poster

Attended Courses and Schools

- 2023 K-GMT summer school, *KyungJu, Korea*
- 2020,2021 KIAS cosmology summer school, *ZOOM*
- 2018 Summer School in Statistics for Astronomers XIV, *Pennsylvania University, USA*
- 2017 Gravitational wave school, *Sejong, Korea*

Other activities

- 2021-2024 Student committee of preventing sexual harassment in KASI
- 2020-2021 Korea astronomy encyclopedia assistant (public outreach)
- 2019 Group student meeting organizer
- 2018 UST Student representative

2018 UST Journal club organizer
2015-2016 KNU University assistant officer of major

Experience of Data

Optical SDSS, S-PLUS
Spec HeCS
Sim N-cluster run simulation, Illustris-TNG

Skills

programming IDL, Python
Web HTML/CSS, JavaScript
Utilities Topcat, ds9, IRAF, specpro, HSRED, SExtractor, SCAMP, SWARP, pPXF
Communication Korean (native), English (TOFLE: 81 (2021.11), fluent), Spanish (beginner)

Major collaboration

Nucleo Milenio de Galaxias (MINGAL)
Southern Photometric Local Universe Survey (SPLUS)
KASI-Deep Rolling Imaging Fast Telescope (K-DRIFT)

References

Jongwan Ko, *Ph.D Supervisor*.

- o Affiliation :
- o 1) Korea Astronomy and Space science Institute, Staff scientist
- o 2) University of Science and Technology, Professor
- o E-mail : jwko@kasi.re.kr

Rory Smith, *Principal Investigator*.

- o Affiliation : Universidad Technica Frederico de Santa Maria, Santiago, Chile
- o Associate Professor
- o E-mail : rorysmith274@gmail.com
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