The 10th KIAS Workshop

on Cosmology & Structure Formation

Oct. 24 ~ 28, 2022

KIAS 5F Conference Hall

Korea Institute for Advanced Study, Seoul, Korea

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I. About KIAS

Korea Institute for Advanced Study (KIAS) was founded in 1996 by the Korean Government to promote research excellence in the basic sciences. KIAS is located on a 120,000 square-metre site in Seoul, where its members are provided with a research-friendly environment. As a flagship of the basic sciences in the region, KIAS provides a venue for advanced learning and the active discovery of new ideas. Through these efforts, the Institute ultimately aims to contribute to the advancement of our civilization.

KIAS is an arena for dynamic scientific interactions. Scientists from all over the world visit KIAS for collaborative research, sabbatical leave, and undertake various research activities. In pursuit of fulfilling its mission, KIAS also hosts numerous meetings, seminars, workshops, and seasonal schools. The faculty and research bodies of the Institute are composed of diverse nationalities, and endeavour to explore the frontier of knowledge and insights into Nature and its structure. KIAS, aspiring to be a world-class hub of research activity, welcomes opportunities of interaction with research communities around the world.

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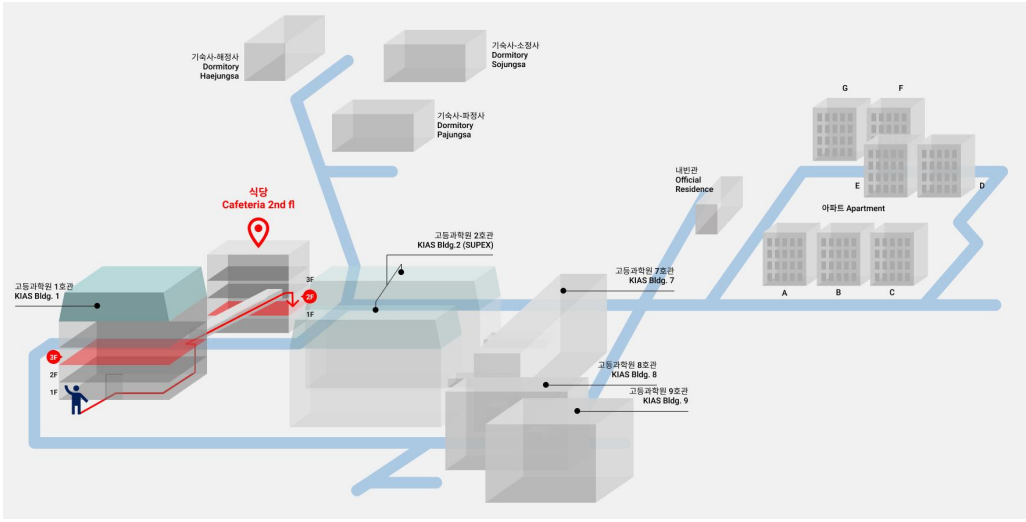
Campus map



Building 1 (Venue: Conference Hall on the 5th floor of Building 1)

1st fl. Entrance A, B, Auditorium, International Conference Hall

2nd fl. President's Office, Faculty Offices, Administrative Offices

3rd fl. Faculty Offices, Supply Room

4th fl. Seminar Rooms, Administrative Offices, Discussion Room, Research Fellow Offices

5th fl. Seminar Rooms, Faculty Offices, Fellow & Visitor Offices

SUPEX (Building 2)

2nd fl. Café "Atrium" (coffee shop ideal place for discussion)

Building 7
3rd fl. Entrance C, Discussion Room, Seminar Room

Building 8
B1 fl. Fitness Room
1st fl. Library, Seminar Rooms, Discussion Room
2nd fl. Visitors Offices, Seminar Rooms, Administrative Offices
3rd fl. Faculty Offices, Visitors Offices, Research Fellow Offices, Seminar Rooms
4th fl. Faculty Offices, Visitors Offices, Research Fellow Offices, Seminar Rooms

Union Building
1st fl. Table Tennis Court
2nd fl. Cafeteria (Korean food), Dispensary, Infirmary
3rd fl. Woori Bank, Post Office, Convenience Store, Copy room, Bookstore
4th fl. Cafeteria (Korean food)

More information on campus facilities:

https://www.kias.re.kr/kias/main/contents.do?menuNo=407012

https://www.business.kaist.edu/life/070601

II. About the Conference

This workshop will be held at the Korea Institute for Advanced Study in the **Conference Hall on the 5th floor of Building 1**. This workshop aims to bring together worldwide researchers for open and active discussions about cosmological challenges to structure formation in the era of JWST. The JWST, a thirty-year-long project, is being commissioned for scientific observations. It is expected to provide a unique window to the uncharted universe after the first star formation and the exoplanets that are believed to host life or even intellectual life forms.

We understand that we are now in the revolutionary era in cosmology and structure formation. Therefore, it would be necessary for researchers to meet together and discuss their recent findings and future prospects in each research field. The workshop program includes theoretical cosmology, cosmological observations, computational astrophysics, galaxy formation and evolution, gravitational lensing, and the artificial intelligence application to various astrophysical problems. We hope all the participants will enjoy the workshop, their stay at KIAS, and the panchromatic view of Korean autumn.

Workshop topics

- Observational cosmology in the far and deep field
- Multi-messenger astronomy
- AI in astronomy & astro-statistics
- Computational cosmology
- Cosmological challenges posed by observations
- Energetic phenomena in extragalactic environments
- Large-scale structures and galaxy environments
- Theoretical cosmology

Webpage: http://events.kias.re.kr/h/cosmology2022/

III. PROGRAM

DATES:

from Monday 24th October 2022

up to Friday 28th October 2022

Monday 24th

Galaxy Surveys and Galaxy Clustering

Tuesday 25th

Disc galaxy, Reionization, LSS and Galaxy Clusters

Wednesday 26th

Discussions, free afternoon and Workshop Banquet

Thursday 27th

Theoretical cosmology, CMB, Galaxies and simulations

Friday 28th

Deep Learning, Milky way, Lensing, and simulation

MONDAY 24th October		
09:20 - 09:30	Welcome Remarks	Juhan Kim
Galaxy Surveys-I		
09:30 - 09:50	Future Optical/Near-Infrared Spectroscopy with DESI Upgrades and MegaMapper	David Schlegel
09:50 - 10:10	7-Dimensional Telescope for Multi Messenger Astronomy and Spectral Mapping of the Universe	Myungshin Im
10:10 - 10:30	GMACS - A Moderate Resolution Optical Spectrograph for the Giant Magellan Telescope	Daniel Fabricant
10:30 - 10:50	Latest Results from the Hobby-Eberly Telescope DE exp.	Karl Gebhardt
10:50 - 11:10	**Coffee Break**	
Galaxy Surveys-II		
11:10 - 11:30	Synergistic Redshift Tomography in the Era of Sky Surveys	Yi-Kuan Chiang
11:30 - 11:50	4MOST, 4HS, the growth of cosmological structure (online)	Edward Taylor
11:50 - 12:10	A-SPEC: All-sky SPECtroscopic survey of nearby galaxies	Ho Seong Hwang
12:10 - 12:30	Aspera: The UV Small-Satellite mission for mapping warm-hot gas in nearby galaxy halos (online)	Haeun Chung
12:30 - 14:00	**LUNCH**	
Galaxy Clustering-I		
14:00 - 14:20	Cosmological constraints from galaxy-galaxy lensing and galaxy clustering with HSC-Y1 and BOSS data	Hironao Miyatake
14:20 - 14:40	3D clustering and connectivity of critical points with Lyman-alpha tomography	Katarina Kraljic
14:40 - 15:00	Observational Studies of Galaxy Intrinsic Alignments at z>1	Tonegawa Motonari
15:00 - 15:20	Angular clustering and host halo properties of emission line galaxies at z>1 in the Subaru HSC survey	Teppei Okumura
15:20 - 15:30	Cosmological Information from Higher Order Clustering	Sumi Kim
15:30 - 16:00	**Coffee Break**	
Galaxy Clustering-II		
16:00 - 16:20	Photometric Objects around Cosmic Webs (PAC) Delineated in a Spectroscopic Survey (online)	Yipeng Jing
16:20 - 16:40	Constraints to wCDM model with the redshift dependence of the Alcock–Paczyński effect from galaxy clustering	Fuyu Dong
16:40 - 16:50	Forecasting the success of next generation wide-field surveys on the extraction of filaments (online)	Daniel Cornwell
16:50 - 17:10	Three methods for cosmological analysis in the non-linear clustering region (online)	Xiao-Dong Li
17:10 - 17:30	Understanding the formation of passive galaxies at high redshift: Why we need the JWST (online)	Clotilde Laigle

TUESDAY 25th October		
DISC GALAXIES		
09:30 - 09:50	When do disks become bars? (online)	Elena D`Onghia
09:50 - 10:10	Lagrange and Liapunov stabilities of hierarchical triple systems (online)	Yasushi Suto
10:10 - 10:30	Gravity does it all. A top-down multiscale revisitation of the resilience of thin galactic discs	Christophe Pichon
10:30 - 10:50	Quenching of massive disk galaxies (online)	Xi Kang
10:50 - 11:10	**Coffee Break**	
COSMIC REIONIZATION & LARGE SCALE STRUCTURE		
11:10 - 11:30	Redundant Measurement of the Global 21cm Background Spectrum	Kyungjin Ahn
11:30 - 11:50	The first galaxies and reionization: what we have learned from the SPHINX simulations	Joakim Rosdahl
11:50 - 12:10	Large-scale structure measurements from the Australian SKA Pathfinder observatory	David Parkinson
12:10 - 12:20	Revisiting constraints on neutrino mass by probing the morphology of large-scale structure	Priya Goyal
12:20 - 14:00	**LUNCH**	
GALAXY CLUSTERS & ENVIRONMENTS - 1		
14:00 - 14:20	The early hot atmosphere of z ≥ 2 (proto)clusters	Raphael Gobat
14:20 - 14:40	Matter distribution from clusters to cosmic filaments	Celine Gouin
14:40 - 15:00	Co-evolution of Brightest Cluster Galaxies and Their Host Clusters in IllustrisTNG and HectoMAP	Jubee Sohn
15:00 - 15:10	Effects of local environment on AGN in HR5	Ankit Singh
15:10 - 15:20	Cosmology with Galaxy Clusters: impact of systematics and possible tension with CMB	Laura Salvati
15:20 - 15:40	**Coffee Break**	
GALAXY CLUSTERS & ENVIRONMENTS - 2		
15:40 - 16:00	Galaxy environments of massive quasars (online)	Hyunsung Jun
16:00 - 16:20	Death at watersheds: galaxy quenching in low-density environments (online)	Maret Einasto
16:20 - 16:40	The growth of clusters of galaxies from their outskirts (online)	Michele Pizzardo
16:40 - 17:00	The Cosmic Mach Number as an Environment Measure (online)	Sadegh Khochfar
17:00 - 17:10	Tracking Halo Orbits and Their Mass Evolution around Large-scale Filaments	Hannah Jhee
17:10 - 17:30	Cosmological tests of the concordance model	Benjamin L`Huillier

Wednesday 26th October		
DISCUSSION SESSION		
09:30 - 10:30	OPEN DISCUSSION	moderator: Ena Choi
10:30 - 10:50	**Coffee Break**	
10:50 - 12:00	OPEN DISCUSSION	moderator: Jaehyun Lee
12:00 - 14:00	**LUNCH**	
14:00 - 18:00	FREE AFTERNOON or visit Jongmyo Shrine (2 pm) visit Museum Kimchikan (4 pm) visit Bukchon traditional crafts experience centre (4 pm)	
18:00 - 20:00	**Workshop Banquet (@city centre)**	

THURSDAY 27th October		
THEORETICAL COSMOLOGY		
09:30 - 09:50	Galaxy zoo Z-S directed alignment vs theory spin prediction	Ue-Li Pen
09:50 - 10:10	Extracting Cosmological Information from the Topology of Large Scale Structure	Stephen Appleby
10:10 - 10:20	The Effect of Non-Gaussian Primordial Perturbations on Large-Scale Structure (online)	Greco Peña
10:20 - 10:30	If dark matter is fuzzy, the first stars form in massive pancakes (online)	Mihir Kulkarni
10:30 - 10:40	Can background distance measurement remove degeneracy between dark energy models? (online)	Avinash Singh
10:40 - 10:50	A standard siren measurement of the Hubble constant with gravitational-wave	Elahe Khalouei
10:50 - 11:10	**Coffee Break**	
NUMERICAL SIMULATION - I		
11:10 - 11:30	The ELUCID hydrodynamical simulation (online)	Xiaohu Yang
11:30 - 11:50	The Quiescent Galaxy Fraction of High-redshift Galaxy Groups and Clusters: Using the HR5	Seong-Kook Lee
11:50 - 12:00	The Lyman-alpha cosmic web in IllustrisTNG	Chris Byrohl
12:00 - 12:10	The baryonic content of cosmic filaments in the IllustrisTNG simulation	Daniela Galárraga Espinosa
12:10 - 12:20	Lognormal semi-numerical simulations of the Lyman-α forest: comparison with full hydrodynamic simulations	Bhaskar Arya
12:20 - 14:00	**LUNCH**	
CMB & THEORETICAL COSMOLOGY		
14:00 - 14:20	Cosmology with the Giant Magellan Telescope (online)	Matthew Colless
14:20 - 14:40	Perturbation Theory Remixed: Improved Nonlinearity Modeling beyond Standard Perturbation Theory	Donghui Jeong
14:40 - 14:50	Retrieving cosmological information from hot diffuse gas and reionisation signatures in CMB small scales	Marian Douspis
14:50 - 15:00	Measuring the matter-radiation equality scale	Benedict Bahr-Kalus
15:00 - 15:20	Cosmic Birefringence: searching for parity-violating physics with the polarization of the CMB (online)	Patricia Diego-Palazuelos
15:20 -15:40	Towards analytic formulae for Betti numbers	Pravabati Chingangbam
15:40 - 16:00	**Coffee Break**	

CMB & GALAXIES		
16:00 - 16:20	The CMB frontier (online)	François Bouchet
16:20 - 16:40	Low Surface Brightness Galaxies, structure, environment and the case of barred galaxies.	Bernardo Cervantes Sodi
16:40 - 17:00	Horizon Run 5 and massive black hole populations	Chunglee Kim
17:00 - 17:20	Anisotropic satellite accretion onto the Local Group with HESTIA	Alexandra Dupuy
17:20 - 17:30	Cross-Correlation of CMB lensing potential with galaxy catalogues (online)	Chandra Shekhar Saraf

FRIDAY 28th October		
Deep Field Cosmology		
9:30 - 9:50	Cosmology with the MESSIER Surveyor	David Valls-Gabaud
09:50 - 10:00	NIRWL: Constraining the masses of galaxy overdensities at z > 1 in CANDELS and COSMOS	Bomee Lee
10:00 - 10:20	Morphology of Galaxies from the Cosmic Morning to Afternoon	Changbom Park
10:20 - 10:40	Panspermia in a Milky Way–like Galaxy	Sungwook E Hong
10:40 - 11:10	**Coffee Break**	
DEEP LEARNING		
11:10 - 11:30	Deep Learning Approaches to LSS Cosmology	Cristiano Sabiu
11:30 - 11:40	Constraining Cosmology using Self-Attention	Se Yeon Hwang
11:40 - 11:50	Reconstruction of late-time Cosmology using PCA	Ranbir Sharma
11:50 - 12:00	Cosmology with Method of Iterative Smoothing	Hanwool Koo
12:00 - 14:00	**LUNCH**	
MILKY WAY & GRAVITATIONAL LENSING		
14:00 - 14:20	A Chemical Evolution Perspective On Galactic Archaeology	Fiorenzo Vincenzo
14:20 - 14:40	Outlier Detection in Gaia	Owain Snaith
14:40 - 14:50	Etherington duality breaking: gravitational lensing in non-metric spacetimes versus intrinsic alignments	Basundhara Ghosh
14:50 - 15:10	Constraining Self-interaction Cross-section of Dark Matter with Radio Relic Galaxy Clusters	M. James Jee
15:10 -15:30	Deep search for dark matter subhalos in the Milky Way (online)	María Benito
15:30 - 15:50	**Coffee Break**	
NUMERICAL SIMULATION - II		
15:50 - 16:10	How Including New Physics Changes Galactic Evolution In Simulations : Perspectives in the Era of High-resolution Simulations	Ji-hoon Kim
16:10 - 16:20	Halo mass function in scale invariant models.	Swati Gavas
16:20 - 16:40	On the causal origin of properties of DM halos and galaxies: galaxies in their cosmological environment	Corentin Cadiou
16:40 - 16:50	Impact of Radiation Feedback on the Formation of Globular Cluster during Cloud-Cloud Collisions	Daniel Han
16:50 - 17:10	Closing Remarks	Changbom Park

IV. General Information

A. WIFI

There are two different wifi for visitors: either KIAS_OPEN (without password) or eduroam (with your own account).

B. Zoom Instructions

Before the session starts:

1. Please install Zoom in advance.
2. Here is the zoom link to join the meeting.
   https://us02web.zoom.us/j/4316792441
   Meeting ID: 431 679 2441
3. Make sure that the Zoom name displayed on the screen is your full name. If not, please change the name accordingly. This is important for asking questions and for the chairs to identify the speakers.

During the session:

1. The LOC will mute your microphone during the entire session.
2. ***How to ask questions: via zoom chat***
   1. **We request participants to use "chat"** on the side panel on the right of the Zoom window. If not shown, one can click on the chat icon to enable the chat panel. You can post your questions in the chat window **anytime during the session** by sending messages to "Everyone".
      Learn more about Using In-Meeting Chat.

2. During the entire session, our volunteer, a Chat Monitor, will be monitoring the chat box and compiling the questions in the Google doc.
3. After the talk, the chair will check the Google doc for the questions raised. The chair will either read one question in the Google doc and ask the speaker to answer or ask the person who posted the question to speak to him/herself.

During the Q&A/discussion time:

1. The questions that are not picked up after each talk will be covered during the Q&A/discussion time. Please feel free to post questions in the chat room for the discussion.

If you are a speaker:

1. Please join the meeting **15 mins prior to the official start of the session** by clicking on the link to test your connection and screen sharing.
2. Make sure that the Zoom name displayed on the screen is your full name.
3. Please stay in a quiet place during the session.
4. Briefly introduce yourself when prompted by the chair. Start sharing your screen by clicking on the “Share Screen” icon. Learn more about Screen sharing.
    1. Please finish your presentation within the time limit: 20 min talk and 5 min Q&A for invited speakers, 7+3 min for contributed talks.
    2. Click on the red “Stop Share” button to stop sharing when your presentation and Q&A are done.

C. Near KIAS

Restaurants near KIAS

- Korean

- 79 Beonji-gooksujip (79번지국수집)
  Korean Chicken noodle soup, traditional pancakes
- Chowoo maul (초우마을)
  Korean BBQ place. Good for big groups.
- Bongpyung Memil (봉평메밀)
  Tofu soup, spicy noodle, Bossam (Boiled pork)
- Sinŭiju Budae jjigae (신의주 부대찌개)
  Spicy sausage stew

- Japanese & Chinese

- Siki Katsu (시키카츠)
  Authentic Japanese style pork cutlet.
- Oh-Gwan Sushi (오관스시)
  Popular and affordable sushi place.
- Ten (텐)
  Japanese pork cutlet and salmon-don place.
- Sanhaegwan (산해관)
  Chinese restaurant
- Palsunsaeng (팔선생)
  Chinese restaurant good for big groups.

- Italian

- The Table (더테이블)
  Italian restaurant with a few vegetarian options.
  Good for big groups.
- Coronoi (꼬로노이)
  Salad, pasta, steak
- Nova Italiano (노바 이탈리아노)
  Italian with a few vegetarian, vegan options.

- Vegetarian & Vegan

- New Delhi (뉴델리)
  Indian restaurant with some vegetarian options.
- Chorokddl (초록뜰)
  All-vegan Korean restaurant. 25 min walk or bus 201.
- To Go Salad (투고샐러드)
  Salad place with vegetarian & vegan options.
- Subway (서브웨이)
  Vegan options (Veggie delight / Ultimate Sub)

- Coffee & Desserts

- Come to rest (컴투레스트)
  Great coffee and desserts.
- Behind me (비하인드미)
  Good coffee, macarons, and desserts.
- Banchanggo (카페반창고)
  Fully vegan cafe with vegan desserts

Map near KIAS

D. Local transports

The **201** and **273** bus number stop at the bus stop "KAIST/HONGNEUNG Elementary School" near KIAS

The closest subway stations are either the **Korea University / Line 6**, or the **Hoegi station / Line 1**.

We advise you to use either Kakao Map or Naver Map application to organise your travel in Seoul.

Your notebook for the conference :

We thank you for participating in the 10th KIAS Workshop on Cosmology & Structure Formation

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Contact Us

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Supporting stuff: Meeyeon Ju (dearmee@kias.re.kr)

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KIAS KOREA INSTITUTE FOR ADVANCED STUDY