



Programme

**MASSIVE BLACK HOLES  
ACROSS COSMIC TIME  
8-12 SEPTEMBER 2025**

Organised and hosted by the Kavli Institute for Cosmology, Cambridge



**03** Scientific Organising Committee | **04** Day 1 | **05** Day 2 | **06** Day 3 | **07** Day 4 | **08** Day 5

## Monday 8

Jonelle Walsh  
Jens Thomas  
Kirk Long  
Nabanita Das  
Eckhard Sturm  
Rahma Alfarsy  
Sara Rosborough  
Vadim Rusakov  
Francesco D'Eugenio  
Suvi Gezari  
Mitchell Karmen  
Or Graur  
Filippo Mannucci  
Hannah Übler  
Sandra Zamora

## Tuesday 9

Raffaella Schneider  
Antti Rantala  
Elia Cenci  
John Regan  
Aklant Bhowmick  
Lewis Prole  
Caroline Nagib  
Eduardo Bañados  
Daming Yang  
Luca Zappacosta  
Julien Wolf  
Romain Meyer

## Wednesday 10

Dale Kocevski  
Xihan Ji  
Alberto Torralba  
Akos Bogdan  
David Setton  
Jianwei Lyu  
Junya Arita  
Erini Lambrides  
Marta Volonteri  
Martin Bourne  
Stephen Wilkins  
Alessandro Trinca  
Ricarda Beckmann  
Michaela Hirschmann  
Alessandro Marconi  
Sophie Koudmani

## Thursday 11

Andrea Merloni  
Ragadeepika Pucha  
Jan Scholtz  
Colin Burke  
Giovanni Mazzolari  
Masafusa Onoue  
Ignacio del Moral-Castro  
Sophia Geris  
Tiago Costa  
Nicholas Choustikov  
Francesco Bollati  
Daniel Anglés-Alcázar  
Lucas Tortora  
Eun-jin Shin  
Rainer Weinberger

## Friday 12

Cristina Ramos-Almeida  
Manda Banerji  
Darshan Kakkad  
Christina Eilers  
Matilde Brazzini  
Helen Russell  
Andrew Chael  
Avishai Dekel  
Alberto Sesana  
Stephanie Buttigieg  
Peter Johansson  
Yohan Dubois  
Laura Blecha



**Xiaohui Fan (University of Arizona)**  
**Jenny Greene (Princeton University)**  
**Sophie Koudmani (Herts/KICC)**  
**Roberto Maiolino (KICC, co-chair)**  
**Chris Moore (KICC/IoA/DAMPT)**  
**Priyamvada Natarajan (Yale University)**  
**Debora Sijacki (KICC)**  
**Hannah Übler (MPE, co-chair)**



BH MASS MEASUREMENTS

09:00 - 09:30 • Registration

09:30 - 09:40 • Welcome

**Chair: Xiaohui Fan**

09:40 - 10:10 • Jonelle Walsh | [Review Talk](#)

The Dynamical Detection of Supermassive Black Holes in Nearby Galaxies

10:10 - 10:30 • Jens Thomas

Ultra Massive Black Holes in the Local Universe and Beyond

10:30 - 11:00 • Tea & coffee

11:00 - 11:20 • Kirk Long

Unraveling the Quasar Broad-Emission Line Region

11:20 - 11:40 • Nabanita Das

A Stellar Dynamical Mass for the Central Black Hole in MCG-06-30-15

11:40 - 12:10 • Eckhard Sturm | [Review Talk](#)

Measuring Supermassive Black Hole Masses across Cosmic Times with Interferometric Spectro-Sstometry and Reverberation Mapping Techniques

12:10 - 12:30 • Rahma Alfarsy

The Feasibility of Stacked Reverberation Mapping with DESI

12:30 - 14:00 • Lunch

**Chair: Raffaella Schneider**

14:00 - 14:20 • Sara Rosborough

Modeling the Reverberation Response of Multiple Broad Emission Lines in Active Galactic Nuclei

14:20 - 14:40 • Vadim Rusakov

Electron-Scattered Broad Lines at High-Redshift

14:40 - 15:00 • Francesco D'Eugenio

Dense Gas Absorbers Around Little Red Dot AGN

TDES

15:00 - 15:30 • Suvi Gezari | [Review Talk](#)

Searching for the Tidal Disruption of Stars from Massive Black Holes Over Cosmic Time

15:30 - 16:00 • Tea & coffee

16:00 - 16:20 • Mitchell Karmen

A Candidate High-z Tidal Disruption Event at  $z \approx 7$  in COSMOS-Web: the First Photometric Search with JWST

16:20 - 16:40 • Or Graur

Mapping the Inner Parsec of Supermassive Black Holes with Tidal Disruption Events

DUAL /  
MERGING  
BHS

16:40 - 17:00 • Filippo Mannucci

Merging and SMBH Growth

17:00 - 17:20 • Hannah Übler

BlackTHUNDER and Multiple AGN at  $z > 5$  with NIRSpec

17:20 - 17:40 • Sandra Zamora

Black Holes in the Early Universe: a High-z Double AGN and its Overdense Environment from NIRSpec JWST Observations

18:00 - 19:00 • Wine & Cheese



BH SEEDING AND EARLY GROWTH

**Chair: Priyamvada Natarajan**

**09:00 - 09:30** • Raffaella Schneider | [Review Talk](#)

Black Holes at Cosmic Dawn: Seeding and Early Growth in the Young Universe

**09:30 - 09:50** • Antti Rantala

Formation of Supermassive Black Hole Seeds in Dense, Clustered Stellar Environments

**09:50 - 10:10** • Elia Cenci

Modelling of Direct-Collapse Black Hole Seeds in Large-Scale Cosmological Simulations

**10:10 - 10:30** • John Regan

Modelling Massive Black Hole Formation and Growth in the Early Universe

**10:30 - 11:00** • Tea & coffee

**11:00 - 11:20** • Aklant Bhowmick

BRAHMA Simulations: Unveiling the First Seeds of Supermassive Black Holes using Cosmological Hydrodynamic Simulations

**11:20 - 11:40** • Lewis Prole

Simulating High Redshift Star & Black Hole Formation

**11:40 - 12:00** • Caroline Nagib

Seeing the Invisible: Developing the First Comprehensive Simulation of Direct-Collapse Black Hole Formation

**12:00 - 12:10** • Flash Talks

Yuki Isobe, Maulik Bhatt, Aryanna Schiebelbein-Zwack, Emma Weller and Linhua Jiang

**12:10 - 12:20** • Flash Talks

Ben Wang, Radha Anil Gharapurka, Katherine Kauma, Giulia Ortame, Xiaojing Lin

**12:20 - 13:50** • Lunch

**Chair: Hannah Übler**

**13:50 - 14:20** • Eduardo Bañados | [Review Talk](#)

Review on Quasars in the Early Universe

**14:20 - 14:40** • Daming Yang

Euclid: A Gold Mine of  $z > 7$  Quasars

**14:50 - 15:00** • Luca Zappacosta

Probing the First Quasars During Reionization: Unprecedented X-ray Insights into Their Nature and Growth

**15:00 - 15:20** • Julien Wolf

The First Giant Reionization-Era Quasar Jet Revealed with JWST/NIRSpec IFU

**15:20 - 15:50** • Tea & coffee

**15:50 - 16:10** • Romain Meyer

Discovery of Two  $z \sim 6.5$  Post-Quasar Galaxies in Large Ionised Bubbles

**16:10 - 16:50** • Discussion

led by Jenny Greene, Priyamvada Natarajan, Rachel Somerville

**16:50 - 17:40** • The Einstein Telescope: Opportunities for Cambridge (Parallel event in the Lecture Theatre)

**18:00 - 19:00** • Public Lecture

The Final Frontier: Black Holes in the Infant Universe

MBHs IN THE EARLY UNIVERSE (QSOs)

**Chair: Eckhard Sturm**

**09:00 - 09:30** • Dale Kocevski | [Review Talk](#)

What Little Red Dots Reveal About Black Hole Growth in the Early Universe

**09:30 - 09:50** • Xihan Ji

A Non-Stellar Origin for Balmer Breaks in  
Broad-Line Little Red Dots Discovered by JWST

**09:50 - 10:10** • Alberto Torralba

Dissecting Little Red Dots: Spatially Resolved Spectroscopy of Faint Broad-Line AGN

**10:10 - 10:30** • Akos Bogdan

Detecting the Earliest Supermassive Black Holes with Chandra and JWST

**10:30 - 11:00** • Tea & coffee

**11:00 - 11:20** • David Setton

Even “Goldilocks” Dust Temperatures Struggle to Reconcile  
Implied Reddening with IR Limits in the Most Luminous LRDs

**11:20 - 11:40** • Jianwei Lyu

A Comprehensive Study of MIRI-identified High-z AGN Population

**11:40 - 12:00** • Junya Arita

The Clustering Signature of JWST AGNs: A Missing Link in Quasar Evolution?

**12:00 - 12:20** • Erini Lambrides

Un-obscuring Obscuration: Characterizing  
Representative AGN Growth in the Early Universe

**12:20 - 12:30** • Flash Talks

Yuki Isobe, Atsushi Hoshi, Antonio Porras-Valverde,  
Shashank Dattathri, Mehbuba Ahmed Mohammed

**12:30 - 14:00** • Lunch

**Chair: Debora Sijacki**

**14:00 - 14:30** • Marta Volonteri | [Review Talk](#)

Modeling Massive Black Holes Across Cosmic Time

**14:30 - 14:50** • Martin Bourne

Simulating SMBHs: from Event Horizon to the Cosmic Web

**14:50 - 15:10** • Stephen Wilkins

The FLARES View of Early AGN

**15:10 - 15:30** • Alessandro Trinca

Shedding Light on the Early Rise of Massive Black Holes with LISA and JWST

**15:30 - 16:00** • Conference photo followed by tea & coffee

**16:00 - 16:20** • Ricarda Beckmann

The Evolving Spin of Massive Black Holes Across Cosmic Time

**16:20 - 16:40** • Michaela Hirschmann

The Art of Modelling Broad-Line and Narrow-Line  
Emission of AGN in Simulated, High-Redshift Galaxies

**16:40 - 17:00** • Alessandro Marconi

Probing Black Hole-Galaxy Co-evolution with HOMERUN:  
From Broad-Line Regions to Ionized Outflows

**17:00 - 17:20** • Sophie Koudmani

A Multi-Scale Exploration of Supermassive Black Holes in the Early Universe

**19:00 - 22:00** • Conference Dinner



**Chair: Jenny Greene****09:00 - 09:30** • Andrea Merloni | [Review Talk](#)

Black Holes Demographics: Constraints from X-ray and Radio Surveys

**09:30 - 09:50** • Ragadeepika Pucha

Tripling the Census of Dwarf AGN Candidates Using DESI Early Data

**09:50 - 10:10** • Jan ScholtzRole of AGN in Galaxy Evolution in  $z \sim 3-11$  with Deep NIRSpec Spectroscopy**10:10 - 10:30** • Colin Burke

Constraints on the Local Black Hole Occupation Fraction

**10:30 - 11:00** • Tea & coffee**11:00 - 11:20** • Giovanni Mazzolari

AGN Under the Eye of JWST: New Selection Techniques and Physical Properties

**11:20 - 11:40** • Masafusa OnoueProbing the Demographics of Supermassive Black Holes and Their Host Galaxies at  $z=6$ **11:40 - 12:00** • Ignacio del Moral-Castro

Dual AGN in Galaxy Mergers: Unveiling Black Hole Growth and Feedback

**12:00 - 12:20** • Sophia Geris

Exploring the Presence of Accreting Black Holes in the Early Universe via JWST Stacking

**12:20 - 12:30** • Flash Talks

• Alice Young, Lucy Ivey, Robert Pascalau, Sowkhya Shanbogh, Maddie Silcock

**12:30 - 14:00** • Lunch**Chair: Sophie Koudmani****14:00 - 14:30** • Tiago Costa | [Review Talk](#)

AGN Feedback: Mechanisms, Modes, Models &amp; Misconceptions

**14:30 - 14:50** • Nicholas Choustikov

The Impact of Radiation- and MHD- Coupled Blandford-Znajek Jets on the ISMs of High-Redshift Galaxies

**14:50 - 15:10** • Francesco Bollati

The Impact of AGN Feedback and Spin on the Evolution of Massive Black Hole Binaries

**15:10 - 15:30** • Daniel Anglés-Alcázar

Investigating Black Hole Accretion and Feedback Self-Regulation in Seyfert Galaxies Using the FIRE-3 Cosmological Hydrodynamic Simulations

**15:30 - 16:00** • Tea & coffee**16:00 - 16:20** • Lucas Tortora

Radiative Feedback of Super-Eddington QSOs at High Redshift in the JWST Era

**16:20 - 16:40** • Eun-jin ShinModeling Black Hole Accretion Through an  $\alpha$ -disc with a Resolved Interstellar Medium in Dwarf Galaxies**16:40 - 17:00** • Rainer Weinberger

Quantifying the Uncertainties of Massive Black Hole Models in Cosmological Galaxy Simulations

**17:00 - 17:30** • Discussion

• led by Karina Caputi, Xiaohui Fan, Jenny Greene



## BH FEEDBACK (OBS)

**Chair: Roberto Maiolino**

**09:00 - 09:30** • Cristina Ramos-Almeida | [Review Talk](#)  
Observational Signatures of Feedback from Massive Black Holes

**09:30 - 09:50** • Manda Banerji  
Evidence for Depleted Gas Reservoirs in a Large  
Sample of ~40 UV-Luminous Type 1 Quasars at  $z=2$

**09:50 - 10:10** • Darshan Kakkad  
Outflow Coupling Efficiency in AGN Host Galaxies Across  
Cosmic Time: Insights from IFU Surveys

**10:10 - 10:30** • Christina Eilers  
Using Lyman-alpha Tomography to Map  
Ionized Bubbles Around Luminous Quasars

**10:30 - 11:00** • Tea & coffee

**11:00 - 11:20** • Matilde Brazzini  
A Tale of Emission and Absorption: Decoding Black-Hole  
Driven Outflows in  $z>5$  Quasars Through Multiple Tracers

**11:20 - 11:40** • Helen Russell  
Quasar Feedback in Massive Galaxies

**11:40 - 12:00** • Andrew Chael  
Black Hole Mass and Spin from Horizon-Scale Images

**12:00 - 12:20** • Avishai Dekel  
Growth of Massive Black Holes in FFB Galaxies at Cosmic Dawn

**Chair: Hannah Übler**

## GWs

**12:20 - 12:50** • Alberto Sesana | [Review Talk](#)  
Learning About Massive Black Holes with Gravitational Waves

**12:50 - 14:00** • Lunch

**14:00 - 14:20** • Stephanie Buttigieg  
Fact or FABLE: Predictions for SMBH Merger Rates from Cosmological Simulations

**14:20 - 14:40** • Peter Johansson  
Modelling the Mergers of Supermassive Black Holes and their  
Gravitational Wave Emission in Cosmological Simulations

**14:40 - 15:00** • Yohan Dubois  
Tracking On-The-Fly Massive Black Hole Binary Evolution  
and Coalescence in Galaxy Simulations: RAMCOAL

**15:00 - 15:20** • Laura Blecha  
Constraining Low-Frequency Gravitational-Wave  
Source Populations with Cosmological Simulations

**15:20 - 16:00** • Conclusions & Wrap-up



Massive Black Holes across Cosmic Time  
at the Kavli Institute for Cosmology, Cambridge  
<https://sites.google.com/cam.ac.uk/mbh2025>