

Physics and Astrophysics of Supermassive Black Holes

Monday, July 10th

Registration (8:00 am – 8:50 am)

Breakfast (8:00 am – 8:30 am)

Introduction (8:50 am – 9:30 am)

8:50 am – 9:00 am Welcome

9:00 am – 9:30 am Solving Einstein's Field Equations
Roy Kerr

Supermassive Black Hole Census (9:30 am – 5:00 pm)

Surveys of Supermassive Black Holes (9:30 am – 3:00 pm)
(Chair: Martin Haehnelt)

9:30 am – 10:00 am Evolution of Quasars at High Redshift
Xiaohui Fan

10:00 am – 10:30 am Supermassive Black Holes in Deep Surveys
Meg Urry

Coffee Break (10:30 am – 11:00 am)

11:00 am – 11:30 am The Obscured X-ray Background and Evolution of AGNs
Andy Fabian

11:30 am – 11:50 am AGN in the COSMOS field
Jonathan Trump

11:50 am – 12:20 pm Binary Supermassive Black Holes
Stephanie Komossa

12:20 pm – 12:30 pm A Compact Supermassive Black-Hole Binary System
Cristina Rodriguez

Lunch (12:30 pm – 2:00 pm)

2:00 pm – 2:30 pm The Sloan Digital Sky Survey
Lei Hao

2:30 pm – 3:00 pm Astrophysical Jets
Mario Livio

Demographics (3:00 pm – 5:00 pm)
(Chair: Chris Impey)

3:00 pm – 3:30 pm Demographics and Implications of Supermassive Black Holes
Doug Richstone

Coffee Break (3:30 pm – 4:00 pm)

4:00 pm – 4:20 pm Detecting Supermassive Black Holes
Andreas Mueller

4:20 pm – 4:40 pm The Relation among Black Holes, their Host Galaxies and AGN
Activity
Alessandro Marconi

4:40 pm – 5:00 pm Beats and Rotation of the Accretion Disk around Supermassive
Black Holes
Miyoshi Makoto

Tuesday, July 11th

Breakfast (8:00 am – 8:30 am)

Supermassive Black Hole Growth (8:30 am – 5:10 pm)

Formation and Growth (8:30 am – 11:20 am)
(Chair: Fulvio Melia)

8:30 am – 9:00 am Primordial Black Holes
Jeremiah Ostriker

9:00 am – 9:30 am Growth of Massive Black Holes in Active Galactic Nuclei
Roger Blandford

9:30 am – 10:00 am Formation, Growth, and Spin of Supermassive Black Holes: GR
Simulations
Stuart Shapiro

10:00 am – 10:10 am Growing Supermassive Black Holes with a Cosmological AMR
Simulation
Robyn Levine

10:10 am – 10:20 am Hierarchical Assembly of Supermassive Black Holes
Marta Volonteri

10:20 am – 10:30 am Cosmological Growth of SMBH: the Connection between
Accretion Physics and Cosmology
Andrea Merloni

Coffee Break (10:30 am – 11:00 am)

11:00 am – 11:10 am Protogalactic SMBH Formation by Turbulent Collapse
John Wise

11:10 am – 11:20 am Radiative Hydrodynamical Simulations of Super-Eddington
Accretion Flows
Ken Ohsuga

Mergers (11:20 am – 2:30 pm)
(Chair: Stephanie Komossa)

11:20 am – 11:50 am The Birth of a Supermassive Black Hole Binary in a Galaxy
Merger
Monica Colpi

11:50 am – 12:10 pm Evolution of SMBH-SMBH and SMBH-IMBH Binaries: Effect
of Large Mass Ratio
Junichiro Makino

Lunch (12:10 pm – 1:40 pm)

1:40 pm – 2:10 pm Supermassive Black Hole Mergers: Astrophysical Kicks and
Gravitational Waves
Joan Centrella

2:10 pm – 2:30 pm What Can Transients Reveal about Massive Black Hole
Assembly?
Milos Milosavljevic

Co-Evolution of Supermassive Black Holes and Host Galaxies (2:30 pm – 5:10 pm)
(Chair: Doug Richstone)

2:30 pm – 3:00 pm The Role of SMBHs in the Formation of Early Type Galaxies
Joe Silk

3:00 pm – 3:30 pm Formation and Growth of Supermassive Black Hole Seeds
Mitch Begelman

Coffee Break (3:30 pm – 4:00 pm)

- 4:00 pm – 4:30 pm Formation of Galaxies and their Supermassive Black Holes
Martin Haehnelt
- 4:30 pm – 5:00 pm Strong Lensing and the Co-Evolution of Galaxies and SMBHs
Chris Impey
- 5:00 pm – 5:10 pm Evidence for a Critical Black Hole Mass above which Star
Formation is Shut Off in Galaxies due to AGN-Feedback
Sadegh Khochfar

Wednesday, July 12th

Breakfast (8:00 am – 8:30 am)

Supermassive Black Hole Growth (cont.) (8:30 am – 12:40 pm)

- 8:30 am – 9:00 am Evolution of the Black Hole-Bulge Relationship in QSOs
Greg Shields
- 9:00 am – 9:30 am Dynamics of Galaxy Cores and Supermassive Black Holes
David Merritt
- 9:30 am – 9:50 am Stellar Dynamics Around Supermassive Black Holes in Galactic
Nuclei
Rainer Spurzem
- 9:50 am – 10:10 am Testing the M-sigma relation at $Z \sim 0.4$
Jong-Hak Woo
- 10:10 am – 10:30 am A Step Toward Constraining Supermassive Black Hole Growth:
Quasar Black Hole Mass Distributions and Mass Functions
Marianne Vestergaard

Coffee Break (10:30 am – 11:00 am)

- 11:00 am – 11:20 am How Did Black Holes Grow?
Smita Mathur
- 11:20 am – 11:40 am Magnetic Fields in the ICM and IGM from Active Galaxies
Hui Li

11:40 am – 12:00 pm Heating Clusters of Galaxies with Supermassive Black Holes
Greg Taylor

12:00 pm – 12:20 pm Quasar Heating in Structure Formation
Evan Scannapieco

12:20 pm – 12:40 pm Population III Black Holes: Where Are They Now?
Brian O'Shea

Lunch (12:40 pm – 2:10 pm)

Supermassive Black Hole Characteristics (2:10 pm – 5:00 pm)

General Properties (2:10 pm – 3:30 pm)
(Chair: Meg Urry)

2:10 pm – 2:40 pm The Central Engine in AGNs
Julian Krolik

2:40 pm – 3:00 pm Accreting Black Holes as Probes of Galaxy Evolution:
Connecting the X-ray Background to the Mid-Infrared
David Ballantyne

3:00 pm – 3:20 pm On the mid-IR to hard X-ray Correlation in AGN
Hannes Horst

3:20 pm – 3:30 pm SMBH Environments—AGN Hosts and Companion Galaxies
Jared Gabor

Coffee Break (3:30 pm – 4:00 pm)

Relativistic Jets (4:00 pm – 5:00 pm)
(Chair: Meg Urry)

4:00 pm – 4:30 pm The FR I/FR II dichotomy and the AGN unification schemes
Duccio Macchetto

4:30 pm – 4:50 pm HST Observations of Low Radiative Efficiency Accretion in
Low Luminosity AGN
Marco Chiaberge

4:50 pm – 5:00 pm On the SEDs of Blazars
Sonia Anton

Thursday, July 13th

Breakfast (8:00 am – 8:30 am)

Supermassive Black Hole Characteristics (cont.) (8:30 am – 12:20 pm)

Accretion Disks (8:30 am – 12:20 pm)

(Chair: Monica Colpi)

8:30 am – 9:00 am First View of the True Big Blue Bump Spectrum in Quasars
Ski Antonucci

9:00 am – 9:30 am Simulating Black Hole Accretion
John Hawley

9:30 am – 10:00 am Spectral Properties of Two-Component Shocked Advective
Flows around Supermassive Black Holes
Sandip Chakrabarti

10:00 am – 10:10 am The Accretion Disk Temperature—Continuum Colors
Relationship in Quasars
Erin Bonning

10:10 am – 10:20 am Flickering of Black Hole Accretion Discs
Michael Mayer

10:20 am – 10:30 am Trapping of Magnetic Flux by Black Hole Accretion Disk
David Garofalo

Coffee Break (10:30 am – 11:00 am)

11:00 am – 11:10 am Hot Plasma Region by MHD Shock Formation in Black Hole
Accretion
Keigo Fukumura

11:10 am – 11:30 am Black Hole Disk Instabilities
Michel Tagger

11:30 am – 11:50 am Modeling Angular Momentum Transport in Turbulent
Magnetized Accretion Disks
Martin Pessah

11:50 am – 12:00 pm The dynamics of warped discs and the Bardeen-Petterson effect
Giuseppe Lodato

12:00 pm – 12:10 pm Constraining Black Hole Spin from X-ray Spectroscopy
Laura Brenneman

12:10 pm – 12:20 pm Stability of Self-Gravitating Accretion Disks in Galactic Centers
Markward Britsch

Lunch (12:20 pm – 1:50 pm)

Nearby Supermassive Black Holes (1:50 pm – 6:00 pm)

Sgr A At the Nucleus of the Milky Way* (1:50 pm – 4:30 pm)
(Chair: Mike Garcia)

1:50 pm – 2:20 pm The Dynamics of Close Interactions between Stars and a Massive
Black Hole
Tal Alexander

2:20 pm – 2:50 pm High-Energy Activity in the Galactic Center and a Period in Sgr
A*
Guillaume Belanger

2:50 pm – 3:10 pm Gas Dynamics in the Circum-Black Hole Environment at the GC
Gabe Rockefeller

3:10 pm – 3:30 pm The Role of Supernovae in Framing the SMBH's environment
Chris Fryer

Coffee Break (3:30 pm – 4:00 pm)

4:00 pm – 4:20 pm Stochastic Particle Acceleration and the Spacetime in Sgr A*
Siming Liu

4:20 pm – 4:30 pm Hierarchical Triple Black Holes in the Galactic Center
Yoko Funato

M31 At the Nucleus of M31* (4:30 pm – 5:30 pm)
(Chair: Tal Alexander)

4:30 pm – 5:00 pm New Measurements of the X-ray/Radio Variability of M31*
Mike Garcia

5:00 pm – 5:30 pm Variable Radio Emission from M31*
Lorant Sjouwerman

Other Nearby Supermassive Black Holes (5:30 pm – 6:00 pm)
(Chair: Tal Alexander)

5:30 pm – 5:40 pm AGN in the Local Universe
Mercedes Filho

5:40 pm – 6:00 pm Radio Emission on Sub-Parsec Scales from the Intermediate-
Mass Black Hole in NGC4395
Joan Wrobel

Banquet (7:00 pm – 9:30 pm)

Friday, July 14th

Breakfast (8:00 am – 8:30 am)

Strong Gravitational Effects (8:30 am – 10:30 am)

The Kerr Spacetime (8:30 am – 9:50 am)
(Chair: John Hawley)

8:30 am – 8:50 am Detecting the Shadow of the Galactic Center Black Hole
Jim Bardeen

8:50 am – 9:10 am Testing Strong-Field General Relativity with Black Holes
Dimitrios Psaltis

9:10 am – 9:20 am Long-term Orbital Interaction Between Stars and a Supermassive
Black Hole Surrounded by an Accretion Disc
Vladimir Karas

9:20 am – 9:40 am The Gravitational Vacuum
Emil Mottola

9:40 am – 9:50 am Black Hole Uniqueness Proofs
Pawel Mazur

Gravitational Waves (9:50 am – 10:30 am)
(Chair: Julian Krolik)

9:50 am – 10:10 am Gravitational Waves
Daniel Holz

10:10 am – 10:20 am On the Gravitational Radiation of a Freely Falling Binary Star in the Field of the Supermassive Black Hole in the Center of the Galaxy
Pierluigi Fortini

10:20 am – 10:30 am Gravitational Waves as Probes of Supermassive Black Hole Formation and Evolution
Savvas Koushiappas

Coffee Break (10:30 am – 11:00 am)

Future Instrumentation and Related Science of SMBH (11:00 am – 12:40 pm)
(Chair: Mitch Begelman)

11:00 am – 11:20 am Observing Massive Black Hole Binaries with LISA
Robin Stebbins

11:20 am – 11:30 am Sensitivity of the LISA Gravitational Wave Antenna Below 100 Microhertz
Peter Bender

11:30 am – 11:40 am Measuring supermassive black hole parameters with LISA
Emanuele Berti

11:40 am – 12:10 pm The Constellation-X Mission
Nick White

12:10 pm – 12:40 pm Black Hole Astrophysics in the New Century
Chris Reynolds